

## **ABSTRACT**

Title of Dissertation: IT'S 3 P.M. DO YOU KNOW WHERE YOUR  
CHILD IS OR WHAT HE/SHE IS DOING? AN  
EXPLORATORY STUDY ON THE TIMING OF  
JUVENILE VICTIMIZATION AND DELINQUENCY

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In recent years, after-school programs have received considerable public and policymaker support for their potential to reduce juvenile delinquency and victimization. In large part, this support stems from a series of recent reports, which indicated juvenile crime and victimization peaks during the after-school hours (Snyder et al., 1996; Snyder and Sickmund, 1999). However, much of the existing research suffers from a few key limitations.

Utilizing self-report data collected from a sample of juveniles participating in an evaluation of after-school programs in Maryland, this study was designed to more

clearly determine the timing of juvenile victimization, delinquency, and substance use by addressing some of the key limitations of previous research. In general, the results of the current study present a somewhat different picture of the timing of juvenile offending behavior. The examination of the aggregated measures indicated juvenile victimization and delinquent was most prominent during the school hours, while substance was elevated during the weekend.

Notably, an examination of the individual offenses revealed more variation in the timing of juvenile victimization and delinquency. The more serious violent offenses for both victimization (e.g. victim of an aggravated assault) and delinquency (e.g. involvement in gang fights) were elevated during the after school hours, while simple assaults offenses (for both victims and delinquents) were overwhelming most prominent during school hours. This finding suggests that one undesirable side effect of grouping youths together for schooling is an increase in simple assault crimes.

In addition, the current study revealed the greatest percentage of substance users reported using cigarettes, smokeless tobacco, alcohol, and marijuana during the weekend hours. However after controlling for the actual amount of time available to use these substances in each time period, cigarette and smokeless tobacco use was slightly more elevated during the after-school hours than during the weekend hours, while alcohol and marijuana use were most prominent during the weekend hours. In sum, earlier studies that either examined a single offense or aggregated crime measures were misleading because the timing of crime varies considerably by type of crime. Implications for policy and future research are discussed.

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by

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## **DEDICATION**

This is dedicated to my future wife, Jenny, for her constant support and love. Your confidence in me has never wavered and I am truly lucky to have found someone so special.

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## **CHAPTER 1: INTRODUCTION**

Juvenile crime has been at the forefront of national public interest for several decades. However, recent official arrest statistics from the Federal Bureau of Investigations (FBI) Uniform Crime Reports (UCR) suggest juvenile crime has generally declined since 1994 (Cook and Laub, 2002; Snyder, 2002). At the same time, data from the 2001 National Crime Victimization Survey (NCVS) suggests juvenile victimization rates experienced similar declines since 1994 (Rennison, 2002).

Despite the recent evidence of declining offending and victimization rates for juveniles obtained from the two major U.S. crime sources (the UCR and the NCVS), the fact remains that as a group, juveniles still have disproportionately high rates of offending and victimization in comparison to adults. An examination of the FBI's UCR 2000 data reveals that relative to their composition in the general population, juveniles were disproportionately arrested for many crimes including burglary, robbery, vandalism, motor vehicle theft, larceny-theft, arson, disorderly conduct, weapons offenses, and stolen property (Snyder, 2002).

A closer examination of self-report surveys reveals that juveniles are also disproportionately involved in criminal victimizations. In 1999, NCVS data indicated that juveniles made up approximately 14 percent of the population ages 12 and older, yet they represented about 25 percent of all persons who reported a violent victimization in this age group (Bureau of Justice Statistics, 2001). In their

analysis of NCVS data from 1995 and 1996, Snyder and Sickmund (1999) reported that rates of serious violent victimization were twice as high for juveniles, ages 12 to 17, as for adults 18 or older and rates of simple assault victimization were three times greater for the younger age group. Additionally, the property crime victimization rate for juveniles was greater than the adult victimization rate, although the difference in property victimization rates was not as large as the difference in violent victimization rates.

The evidence that juveniles as a group are disproportionately involved in both criminal offenses and victimization relative to their composition of the total population provides a solid rationale for a closer examination of the characteristics related to juvenile delinquency and victimization experiences. More specifically, there appears to be a growing concern among juvenile crime prevention advocacy groups and researchers that juvenile involvement in delinquent activities and victimization experiences may be related to the fact that today's youth have considerable amounts of unsupervised time in which they can potentially associate with delinquent peers (Newman, Fox, Flynn, and Christeson, 2000; Wordes and Nunez, 2002). Today's youth may be more likely to experience longer periods without adult supervision as more and more families require both parents or the custodial parent in single parent families to work (National Research Council and Institute of Medicine, 2002). Accordingly, youth who are not supervised by an adult for extended periods of time may have an especially elevated risk for engaging in problem behaviors. For example, Richardson and colleagues (1989) found that eighth grade students who cared for themselves without an adult for 11 or more

hours per week were twice as likely to use drugs as those who were always supervised by an adult. This finding is consistent with the previous literature on family risk and protective factors, which has repeatedly shown that parental supervision decreases association with delinquent peers. Considering association with delinquent peers is one of the largest predictor of subsequent problem behavior (Dishion, Patterson, Stoolmiller, and Skinner, 1991), the link between levels of supervision and juvenile involvement in offending behavior appears plausible.

In order to further examine the relationship between unsupervised time and juvenile offending and victimization patterns, researchers have begun to more carefully examine the time of day when juveniles are likely to offend as well as the time when they are most likely to be victimized themselves. Many juvenile crime prevention researchers and practitioners have suggested that schools are relatively safe domains, and therefore policy initiatives, such as after-school programs which may provide the same supervision benefits of schools, have received considerable public support. The intuition behind such juvenile programs is that the extension of adult supervision beyond what is assumed during the school day, will limit juveniles' exposure to delinquent peers as well as the opportunities youths have to engage in problem behaviors or become the victim of crime themselves.

A series of recent reports explored this issue further by hypothesizing that the time many youths spend without adequate levels of adult supervision may lead to increased levels of juvenile victimizations and crime (e.g. Snyder and Sickmund, 1999; Sickmund, Snyder, and Poe-Yamagata, 1997; Snyder, Sickmund, and Poe-Yamagata, 1996). In partial support of this suggestion, these reports highlighted the



fact that official arrest records suggest juveniles commit crimes and are the victims of crimes at different times than adults. Analyses of official crime data reported in the FBI's National Incident-Based Reporting System (NIBRS) indicated that juvenile serious violent crime peaks between 2 p.m. and 6 p.m. on school days, the hours just after school is dismissed while adult serious violent crime peaks at 11 p.m. (Snyder and Sickmund, 1999; Sickmund et al., 1997). Snyder and Sickmund (1999) also compared the timing of juvenile violent crimes from the NIBRS data to victimization reports from the 1996 NCVS data (Snyder and Sickmund, 1999). The NCVS data illustrated the fact that juveniles were at the highest risk of being a victim of a violent crime between noon and 6 p.m.

This research, which highlighted an apparent peak in juvenile crime during the after-school hours, was widely accepted and was instrumental in solidifying policy-maker support for prevention initiatives such as after-school programs. However, the majority of existing research on the timing of juvenile victimizations and delinquency is either flawed or limited. The first limitation of existing research exploring this topic is that it mostly relies on official police data and therefore fails to rule out the possibility that elevated levels of crime rates were due to police behavior rather than youth behavior. Accordingly, the observed peak in juvenile victimizations and delinquency during the after-school hours reported by previous research may not accurately reflect the time when juveniles are most likely to offend or become the victims of crime themselves.

The second major limitation of the existing research is that police data such as the UCR and NIBRS are likely to underestimate the true proportion of offending

and victimization rates in general since many crimes are never reported to the police. Additionally, these data are likely to minimize the amount of crime observed during the school hours since many school crimes are handled directly by school officials who may not report these incidents to the police (Snyder and Sickmund, 1999).

Third, the major source of victimization reports, the NCVS, collapses all crimes into one of four time periods. These four time periods range from 6 a.m. to noon, noon to 6 p.m., 6 p.m. to midnight, and finally from midnight to 6 a.m. Because the first and second time periods both include school hours, the NCVS is unable to provide precise timing measures that differentiate between school and non-school hours and therefore the NCVS can not provide an accurate analysis of in school versus out of school crime. A fourth weakness of previous research includes the lack of adequate examination of the frequency of juvenile victimization, delinquency, and substance use behaviors relative to the time these events occur.

Finally, previous research has been limited by its focus on aggregate (mostly violent) crimes types and therefore potentially excludes important differences between specific crimes, such as property and substance use offenses. While previous research has been beneficial for drawing attention to the importance of examining the timing of juvenile victimization and crime, the limitations of this research suggest the peak observed for these behaviors during the after-school hours may not be entirely accurate and therefore a more detailed exploration of the timing of specific juvenile victimization, delinquency, and substance use experiences is warranted.

This study will advance our understanding of the timing of juvenile victimization, delinquency, and substance use by carefully examining the self-reported behaviors of a sample of 817 youth participating in the evaluation of the Maryland After School Opportunity Fund Program (MASOFP) initiative. This study will address the limitations of previous research discussed above by asking juveniles specific questions about their own delinquent behavior and victimization experiences, as well as asking youths to estimate the time of day when these behaviors usually occurred. Furthermore, this study will expand on previous research by including analyses on the timing of juvenile substance use experiences and by providing a disaggregated investigation of specific crime types, which to date have not been adequately examined. Chapter Two presents a review of the existing literature relevant to this topic while Chapter Three details the methodology used in this study, including a description of the data set, measures and plan for analysis. Chapter Four presents the results of the analyses and Chapter Five provides a discussion of the results and implications of these findings.

## **CHAPTER 2: REVIEW OF PREVIOUS RESEARCH**

The following chapter reviews the literature relevant to this study. First, the research exploring the patterns of offending by and against juveniles is discussed to provide a background for the importance of examining juvenile problem behavior in general. Next, a review of existing research regarding the timing of juvenile victimization, delinquency, and substance using behaviors is provided as a point of emphasis for the current study, followed by a discussion of the limitations of prior research. Finally, the weaknesses of prior research are utilized to provide a rationale for each of the individual research questions to be examined in the current study.

### **Patterns of Juvenile Delinquency**

Perhaps influenced by high profile cases involving juveniles who commit violent crime against other youths, public concerns regarding juvenile delinquents appear to have escalated. For example, a recent public interest poll indicated 62 percent of survey respondents believed juvenile crime increased in 2000 (Brooks, Schiraldi, and Zidenberg, 2000). However, the FBI's UCR data suggests juvenile crime has been declining for several years. Since the peak year of juvenile arrest for violent crimes in 1994, violent crime arrest rates have steadily decreased (Cook and Laub, 2002) as evidenced by the 41 percent reduction in this rate from 1994 to 2000 (Snyder 2002). Arrest rates for juvenile property crime have experienced similar

declines (Cook and Laub, 2002). Between 1994 and 2000, the juvenile property crime arrest rate dropped 37 percent to its' lowest level since at least the 1960s (Snyder, 2002).

While much of what is reported on juvenile offending is based on data obtained from official arrest statistics such as the UCR, self-report surveys do not always indicate the same general decline in juvenile offending as reported in the previously discussed official arrest rate statistics. In fact, some self-report data sources suggest higher incidence rates than those reported in official arrest statistics such as the UCR. As stated in the 2001 Report of the Surgeon General (United States Department of Health and Human Services, 2001), an examination of juvenile self-report data suggests violent behavior is nearly as prevalent today as it was during the earlier violence epidemic prior to 1994. After increasing approximately 50 percent from 1983 to 1993, the incident rate of self reported serious assault and robbery remained essentially level through 1998 (United States Department of Health and Human Services, 2001). The authors of the 2001 Surgeon General Report concluded that despite the observed recent decline in juvenile lethal violence, the self-reported proportion of young people involved in nonfatal violence has not dropped from the peak years in the mid 1990s, nor has the proportion of students injured with a weapon at school declined significantly (United States Department of Health and Human Services, 2001).

Another major source for juvenile crime data is the Youth Risk Behavior Surveillance System (YRBSS). The YRBSS began in 1990 and is a national school-based survey conducted every two years by the Centers for Diseases Control and

Prevention in collaboration with Federal, state, and local partners. The YRBSS is representative of students in grades 9 through 12. Data from the 2001 YRBSS indicated that 17.4 percent of students reported carrying a weapon in the past 30 days and 33 percent reported being in at least one physical fight in the last year (Grunbaum et al., 2002). However, YRBSS data indicate the percentage of juveniles who reported carrying a weapon and engaging in a physical fight has steadily decreased every two years from 1991 through 2001 (Centers for Diseases Control and Prevention, 2002).

One final data source, the National Longitudinal Study of Adolescent Health (known as the Add Health Study) suggests juveniles may offend at higher rates than those reported in the YRBSS data. Data from surveys administered to a nationally representative sample of juveniles in grades 7 through 12 indicate that 40 percent of the sample reported committing a violent crime (defined as getting into a serious physical fight, hurting someone badly enough to need medical treatment, using or threatening to use a weapon to get something from someone, shooting or stabbing someone, or pulling a knife or gun on someone) in the first year of data collection (1995) and 23 percent reported committing a violent crime in the second year (1996) of data collection (Shaffer and Ruback, 2002).

Despite mixed evidence of offending rates for juveniles obtained from official arrest statistics and self-report data, the fact remains that statistical evidence consistently suggests disproportionately high rates of offending by juveniles. This evidence is provided both from official arrest records as well as from self-report surveys that ask about offending experiences.

In their examination of the FBI's UCR data, Snyder and Sickmund (1999) noted that juveniles accounted for a disproportionately large amount of arrests for many crimes relative to their composition in the population. Specifically, Snyder and Sickmund (1999:116) concluded that based on their representation in this population, juveniles were disproportionately involved in arrests for arson, burglary, larceny-theft, robbery, vandalism, motor-vehicle thefts, and weapons law violations. In addition, UCR data indicates that arrest rates for murder, forcible rape, robbery, and aggravated assault are higher for teens' ages 17 to 19 than for any other age group (Federal Bureau of Investigation, 2000).

Furthermore, surveys of self-reported behaviors of adolescents and young adults indicate high rates of offending among these age groups (Lauritsen, Sampson, and Laub, 1991; Shaffer and Ruback, 2002), while surveys of victims' perceptions of offender characteristics indicate the most common age group for offenders committing violent crime is young adults ages 18 through 20, followed by juveniles ages 15 through 17 (Hindelang, 1981). In sum, it is apparent that all sources for measuring crime statistics agree that young persons in general, and adolescents in particular, have a greater likelihood of involvement in criminal activity.

### **Patterns of Juvenile Victimization**

The pattern of decreasing juvenile crime rates observed in the UCR data is mirrored by similar declines in juvenile victimizations rates. In 2001, the NCVS indicated that violent and property crime victimization rates for all age groups decreased respectively from the previous year and furthered a downward trend in

criminal victimizations that began in 1994 (Rennison, 2002). The decline in juvenile violent victimizations has been particularly sharp for juveniles, ages 12-19, as the violent victimization rate decreased approximately 50 percent from 1994 to 2001 (Bureau of Justice Statistics, 2002). In general, the victimization rates for serious violent crime at school and away from school have declined from 1992 to 2000 (DeVoe et al., 2002).

While the NCVS data present a clear picture of declining victimization rates in recent years, research continues to indicate that younger persons remain the most susceptible to victimizations. In general populations, age has been found to have a distinct relationship with victimization, but contrary to the popular perception, the elderly have a low likelihood of victimization (Esbensen and Huizinga, 1991). Rather, survey samples have found young people tend to have the highest likelihood of becoming the victims of crime (Gottfredson, 1986). Hashima and Finkelhor (1999) examined the NCVS data from 1994 in order to compare violent victimization for youth (12 to 17 years old) versus adults (18 years and older). Their analysis found that the overall violent crime victimization rate for youth ages 12 to 17 in 1994 was 2.7 times higher than the rate for adults. Furthermore, the authors concluded that youth were almost three times more likely than adults to have a crime related injury (Hashima and Finkelhor, 1999:806).

In a separate analysis, the examination of age patterns in non-fatal violent victimizations (rape, robbery, sexual assault, and assault) from the NCVS data from 1976 through 2000 indicated that juveniles (persons aged 12 through 17 in the NCVS data) were generally victimized at rates greater than those 18 and older since



1985 (Klaus and Rennison, 2002). In their re-examination of the NCVS data from 1995 and 1996, Snyder and Sickmund (1999:26) reached similar conclusions and noted that juveniles were twice as likely as adults to be victims of serious violent crimes and three times as likely to be victims of simple assault. Additionally, the property crime victimization rate for juveniles (149 victimizations per 1,000 persons, ages 12 to 17) was greater than the adult victimization rate (129 victimizations per 1,000 persons ages 18 and older), although the differences in property victimization rates was not as large as the difference in the violent victimization rates (Snyder and Sickmund, 1999).

One additional data source, the Add Health Study, indicated juveniles were violently victimized at rates about three times greater than the rates reported by NCVS data (Wordes and Nunez, 2002). Respondents in this nationally representative sample indicated that 19 percent of the sample reported being the victim of a violent crime (defined as having a knife/gun pulled on them, being shot, stabbed, or jumped) in 1995 (Shaffer and Ruback, 2002). If the Add Health estimates are accurate, then the disproportionate risk for victimization of juveniles may be even greater than suggested by the NCVS data. As noted regarding their involvement in criminal activity, the evidence is clear that juveniles are also at a greater risk for being the victim of a crime than their adult counterparts. Therefore, the continued examination regarding the circumstance related to their victimization experiences is warranted.

## **Patterns of Juvenile Substance Use**

One reason for including the examination of juvenile substance use in this study is because research consistently suggests that substance use by juveniles is a substantial predictor of subsequent problem behaviors. For example, one recent longitudinal study examined whether youth who began drinking alcohol at an early age (grade seven) exhibited a greater propensity to report substance use and criminal activity as young adults (age 23) (Ellickson, Tucker and Klein, 2003). The study found that seventh grade drinkers were approximately four times more likely to become weekly marijuana users at age 23 (18 percent) than seventh grade non-drinkers (4 percent). Additionally, seventh grade drinkers were twice as likely (13 percent) to have committed a felony in the past year at age 23 compared to seventh grade non-drinkers (6 percent) at age 23 (Ellickson et al., 2003).

While most sources of juvenile crime data indicate both juvenile crime and victimization have decreased recently, juvenile drug and alcohol use has generally remained steady or increased slightly in recent years. For example, the 2001 National Household Survey on Drug Abuse (NHSDA), an annual survey sponsored by the Substance Abuse and Mental Health Services Administration (SAMHSA) indicated that 10.8 percent of youth ages 12 to 17 were current users in 2001, meaning they report using an illicit drug at least once in the month before being interviewed (Substance Abuse and Mental Health Services Administration, 2002). This percentage is a slight increase from 2000 when 9.7 percent of youths surveyed by NHSDA reported using at least one drug in the past month (SAMHSA, 2002). The Monitoring the Future survey also collects data on past year and past month

drug use. In 2002, 17.7 percent of eighth graders, 34.8 percent of tenth graders, and 41 percent of twelfth graders reported using an illegal drug in the one-year period before being surveyed. Approximately 10.4 percent of eighth graders, 20.8 percent of tenth graders, and 25.4 percent of twelfth graders reported using an illicit drug during the past month (Office of National Drug Control Policy, 2003).

Alcohol use among juveniles is also a concern as estimates from the NHSDA data suggest an estimated 17.3 percent of youths aged 12 to 17 report using alcohol in the month prior to the survey interview (SAMHSA, 2002). Concerns for alcohol use are further exacerbated considering the possible effect on teen driving behaviors. Estimates from the 1999 YRBSS suggest approximately one-third of high school students rode with a driver who had been drinking alcohol one or more times in the 30 days preceding the survey and 13.1 percent had driven a car themselves one or more times after drinking alcohol in the 30 days preceding the survey (Kann et al., 2000).

At the same time, use of tobacco products by juveniles is important to examine considering previous research suggests students who use cigarettes and other tobacco products reported engaging in a significantly greater number of health risk behaviors compared to children who had never smoked cigarettes. Farrell, Danish and Howard (1992) noted that ninth graders in a longitudinal urban sample from a large southeastern city who had smoked cigarettes in the past 30 days were significantly more likely to engage in other problem behaviors such as using marijuana, shoplifting, threatening someone with a weapon, and selling drugs. According to NHSDA data, past month tobacco use (defined as use of several

tobacco products including cigarettes, chewing tobacco, cigars, and pipes) among youths ages 12 to 17 decreased slightly from 17.3 percent in 1999 to 15.1 percent in 2001 (SAMHSA, 2002). In sum, the propensity of juveniles to experiment with substances, including marijuana, alcohol, and tobacco, coupled with the likelihood that these substance-using behaviors will lead to subsequent problem behaviors, suggests that a further examination of the patterns of these behaviors is necessary.

### **Timing of Juvenile Delinquency, Victimization, and Substance Use**

The patterns of juvenile delinquency, victimization, and substance use were reviewed above to provide a background for the relevance of a more specific review regarding the timing of these behaviors. Given the recent national headlines such as the tragic shootings in Columbine, an abundance of recent research has specifically focused on juvenile crime that occurs during the school day when juveniles interact on a regular basis (e.g. United States Department of Education, National Center for Education Statistics, 2002; DeVoe et al., 2002; Gottfredson, 2001; Chandler, Chapman, Rand, and Taylor, 1998). While shocking incidents of shootings at schools have focused a great deal of media attention on the safety of our nation's students, many questions still exist regarding whether schools are criminogenic places or whether they are relatively safe. In fact, many researchers point to statistics obtained from the official arrests data, which suggest juveniles are probably safer at schools than out of school (Snyder and Sickmund, 1999).

However these arrest statistics may actually underestimate the true proportion of juvenile crime and victimization that occur within school boundaries

since many in-school crime incidents go unreported to the police (Snyder and Sickmund, 1999). In their analysis of the NCVS data, Whitaker and Bastian (1991) found that only nine percent of violent crimes against juveniles occurring in school were reported to the police compared with 37 percent of those occurring on the streets. Similarly, in their review of juveniles, ages 12 through 17 from the 1995-1996 NCVS data, Finkelhor and Ormrod (1999) noted that approximately 15 percent of school victimizations of juveniles were reported to police, while approximately 37 percent of non-school victimizations were reported to the police.

When estimates of juvenile crime experiences are obtained using self-report surveys, the amount of victimization and crime experienced by school-aged youth appears disproportionately higher when compared to the amount of time juveniles spend in school. In other words, comparisons of in-school and out-of-school crime can be better understood when one considers the amount of time students typically spend in school. Gottfredson (2001:21) estimated that students spend 18 percent of their waking hours in schools. However an examination of the 1999 NCVS School Crime Supplement data reveals that 67 percent of all crimes and 50 percent of serious, violent crimes among juveniles, 12-14 years old occurred at school or on the way to and from school (calculated from tables in USDE, 2002 report). This suggests juveniles are disproportionately victimized while at school relative to the percentage of time they spend at school. In an earlier study, Whitaker and Bastian's (1991) examination of the NCVS indicated that juveniles, ages 12 through 15 experienced 37 percent of violent crimes and 81 percent of the thefts while on

school property, which also confirms this group experienced these victimizations at a rate that was disproportionately higher than their time spent in school.

Additional self-reports of health risk behaviors occurring in schools, such as the YRBSS (Centers for Diseases Control and Prevention, 2002) also suggest somewhat higher rates of in-school victimization than previously reported in official arrest statistics. The YRBSS data from a nationally representative sample of students in grades 9 through 12 monitors several indicators of health behaviors and also examines specific youth conduct with respect to general behavior and behavior that occurred in school. In 2001, the YRBSS data indicated that approximately 37 percent of students, who carried a weapon in the past 30 days, did so while on school property, while nearly 40 percent of reported fights occurred on school property (DeVoe et al., 2002). Again, these data reflect percentages of in-school crime that are greater than the percentage of time spent in school.

Another study conducted by Garofalo, Siegel, and Laub (1987) which analyzed the structured Incident Reports and narratives from 850 victimizations from the National Crime Survey (NCS) of juveniles' ages 12 and 17 reported similar conclusions regarding school crime. Their analysis found that 54 percent of these 850 victimizations were categorized as school related; meaning they occurred at some point during the process of attending school (Garofalo et al., 1987:329). Still, the authors speculated their analyses might have underestimated the extent of school related victimizations because more than half of the narratives did not contain information about the location of the incident.

Perhaps it should not be surprising that self-report data suggests in-school crime and victimization rates may be somewhat higher than previously expected. Recently, the concentration of delinquency prone adolescents has increased at schools as the proportion of youth enrolled in school has grown (Gottfredson, 2001). Since schools aggregate large numbers of teenagers in one place for long periods of time, schools may actually have the unintended consequence of exposing all youth in general to a larger sample of other delinquency prone adolescents. Therefore schools can potentially increase a juvenile's risk for being the victim of a crime and/or the risk of involvement in delinquent behavior simply by increasing their exposure to a pool of other delinquent youth. The idea that juveniles may be more likely to be the victim of a crime while at school seems to be supported by a recent study by the National Center for Education Statistics and the Bureau of Justice Statistics (1998), which reported that students were victims of 3.3 million crimes at school and 3.1 million away from school in 1996. When one considers that youths spend less than 20 percent of their waking hours in school, the discrepancy between in-school and out-of-school victimizations seems even larger.

In a recent article completed by researchers at the Kennedy School of Government at Harvard University, the authors utilized NIBRS data to examine juvenile school crime by comparing teacher in-service days, when juveniles are excused from school (but would otherwise be expected to attend since the days fall within the regular school calendar), against days when school was in session. Jacob and Lefgren's (2003) analyses indicated that on days in which school was in session, violent crimes committed by juveniles increased by 28 percent compared

with days when school was not in session due to teacher in-service days.

Alternatively, the authors noted that property crimes decreased by 14 percent on days when school was in session relative to teacher in-service days (Jacob and Lefgren (2003).

Although these studies suggest certain types of juvenile victimization and crime in schools may be more prevalent than previously thought, the overall rates of serious criminal victimization in school remains relatively low (Gottfredson, 2001). In their review of school victimizations, Gottfredson and Gottfredson (1985) noted that more serious forms of juvenile victimization such as those resulting in serious physical injury or large monetary losses, were rare in comparison to other more minor victimizations. In a national survey of secondary school students, Gottfredson, Gottfredson, and Czeh (2000) found that 49.6 percent of students reported a minor theft of items worth less than \$1 while 45 percent of students reported theft of items worth more than \$1. When asked about more serious forms of victimizations, 19.1 percent of students reported being threatened with a beating, 11.6 percent reported being the victim of a physical attack, and 5.0 percent reported being threatened with a knife or gun (Gottfredson et al., 2000).

An examination of juvenile substance use during the school day suggests this type of behavior may also be more prevalent than previously thought. For example, slightly more than five percent of the students in grades 9-12 who were surveyed as part of the 2001 YRBS reported using marijuana at least once on school property, while 24 percent reported using marijuana anywhere (which could include on school property) in the 30 days before being surveyed (USDE, 2002).



Additionally, approximately five percent of the youths in the 2001 YRBS sample reported having at least one drink of alcohol on school property in the 30 days before the survey (ONDCCP, 2003), while 47 percent of the same sample reported having at least one drink of alcohol anywhere.

While the research reviewed above specifically discusses juvenile victimization, delinquency, and substance use that occurred during the school day, researchers have recently more closely examined the time period immediately after school when juveniles are often left unsupervised until their parents arrive home from work. In actuality, criminologists observed an apparent peak in crime after school more than 50 years ago. In 1945, Kvaraceus examined New Jersey juvenile court referrals and reported that more juvenile crime occurred on weekdays than on weekends and that juvenile crime peaked following the end of the school day in the mid-afternoon period.

A half-century later, Snyder, Sickmund, and Poe-Yamagata (1996) examined the proportion of violent crimes reported to law enforcement agencies at various times of day. These analyses examined data from the FBI's National Incident Based Reporting System (NIBRS) from South Carolina in 1991 and 1992. Although the intent of the study was to evaluate the potential prevention effects of curfew laws, the report found that a higher percentage of violent crimes (22 percent versus 17 percent) occurred during the hours between 2 p.m. and 6 p.m. on weekdays than during the hours between 10 p.m. and 6 a.m. on weekdays and between midnight and 6 a.m. on weekends. Consequently, the authors concluded

that more violent crimes occur during the after-school hours than during hours when a curfew restriction would take place (Snyder et al., 1996).

The authors further replicated this initial study with a larger sample of NIBRS data from 12 states for the years 1991 through 1996 (Snyder and Sickmund, 1999; Sickmund et al., 1997). This analysis confirmed that juvenile serious violent crime peaked between 2 p.m. and 6 p.m. on school days, the hours just after school is dismissed while adult serious violent crime peaked at 11 p.m. (Snyder and Sickmund, 1999; Sickmund et al., 1997). Additionally, the authors examined the NIBRS data to explore the peak crime for juvenile victimizations. The analysis suggested that juveniles were at the highest risk of being the victims of a violent crime in the four hours following the end of the school day, which they estimated to be between 2 p.m. and 6 p.m. In order to investigate the possibility that the observed pattern, which was based on reports of crime to the police, did not differ from the actual pattern of crime against juveniles, data from the 1996 NCVS were analyzed. The results indicated that juvenile victims reported even more crime occurring between noon and 6 p.m., which includes the after-school period, than indicated by the NIBRS data. The NCVS data showed that juveniles were at the highest risk of being a victim of violent crimes, including robbery, aggravated assault, and simple assault between noon and 6 p.m. (Snyder and Sickmund, 1999). This data, which highlighted elevated levels of juvenile criminal victimization and offenses during the after-school hours, had a substantial influence on policy makers

and helped contribute to the recent exploration of possible prevention tools such as after-school programs<sup>1</sup>.

However, a more recent study based on self-report data from both the National Study of Delinquency Prevention in Schools (NSDPS; Gottfredson, Gottfredson, and Czeh 2000) and a sample of youths participating in Maryland After School Community Grant Programs (MASCGRP) presented a slightly different picture on the timing of adolescent delinquency in comparison to the work of Snyder and his colleagues. In their study, Gottfredson, Gottfredson, and Weisman (2001) found a similar, although less marked pattern of delinquent behavior during the after-school hours. Their analyses of the timing of self-report delinquent behavior in adolescents noted the observed peak in juvenile crime during the after-school hours was more modest than the peak observed in the NIBRS data as reported by Snyder and colleagues. In addition, the MASCGRP data revealed that juvenile crime was actually the most elevated in the period before school began after the data was standardized to control for the number of hours in each observed time period (Gottfredson et al., 2001). In a follow-up study utilizing MASCGRP data from a subsequent year, Gottfredson and Soulé (2003) noted the timing of juvenile delinquency varied by crime type. Crimes against persons were elevated during the after-school hours, but not as much as during and before school. Neither property nor substance use offenses were prominent during the after-school hours.

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<sup>1</sup> It should be noted Snyder and colleagues (1999) clearly stated their analyses focused on violent offenses. However, proponents of after-school programs have often suggested that all juvenile offenses, in general, sharply increase during the after-school hours.

Additional analyses from the 1999 NCVS School Crime Supplement (SCS) indicated that victimizations at school were most likely to occur during the school day between noon and 3 p.m. (39.7 percent), followed by the time period between 6 a.m. and noon (30.2 percent). Victimization at school were more common during both of these time periods than during the after-school hours of 3 p.m. to 6 p.m. (9.9 percent) (USDE, 2002:13). However, this analysis was limited to victimizations occurring on school property and/or those occurring on the way to or from school.

Research regarding the specific timing of juvenile substance use is less abundant than the research regarding the timing of juvenile delinquency and victimization presented above. However, Gottfredson and Soule (2003) noted the MASCGP sample reported the highest level of substance use during the weekend period. Additionally, one national survey asks students to report the time when juveniles are most likely to use illegal substances. Recent data collected from 109,919 sixth through twelve graders nationwide, who participated in the 2002-2003 PRIDE Survey, indicates that juveniles were most likely to use illegal substances, including alcohol, during the weekend hours as opposed to the before, during, or after school hours and evening weekday hours (PRIDE, 2003). For example, 17.4 percent of junior high students (grades 6-8) reporting drinking beer on the weekend, while 4.0 percent drank beer on weeknights (after dinner) and 3.6 percent drank beer in the after-school hours (PRIDE, 2003). Alcohol use before school and during school was generally reported by less than one percent of the sample. The same general timing pattern persisted for juveniles regarding tobacco use, marijuana use, and other illicit drugs such as hallucinogens and inhalants.

The timing of juvenile substance use may also be considered relative to a student's level of adult supervision. Prior research has linked juvenile problem behavior in general, and substance use in particular, to juveniles' levels of adult supervision, which may vary according to the time of day. The after-school hours have been a point of emphasis considering the growing number of families with both parents working outside of the home and the number of single parent families. These patterns may result in a larger portion of juveniles being unsupervised during the hours between when school ends and parents return from work (United States Department of Education and Justice, 2000).

There is some evidence that the more hours a youth spends unsupervised, the greater the risk they will become involved in problem behaviors, including substance use. For example, Richardson et al., (1989) indicated that eighth grade youth who cared for themselves for 11 or more hours per week without an adult present were twice as likely to use drugs as those who are always supervised. The study concluded this relationship persisted even when youth characteristics that might explain the relationship, such as socioeconomic status and living with a single parent, were statistically controlled. The author's model implied that the higher levels of drug use among the unsupervised teens might be explained in large part by their greater association with delinquent peers. While this study did not specifically examine whether juvenile substance use was elevated after-school relative to other time periods, it does provide the type of evidence often cited by proponents of after-school programs (e.g. Newman et al., 2000) as confirmation for concerns regarding the rate of juvenile substance use during the after-school hours.

In sum, previous research has produced mixed evidence regarding the specific time period when juvenile victimization and delinquent behavior are most likely to occur, while research regarding the timing of juvenile substance use has not been adequately explored. One reason for the lack of consensus regarding the timing of these behaviors is that some of the previously discussed studies had flaws or limitations in their research design, while others have examined a limited measure (e.g. aggregated delinquency only). The limitations of these previous studies are discussed below and provide a rationale for a more advanced exploration of these issues. The goal of this study is to address these limitations and more clearly decipher whether previous research, which emphasized an apparent peak in juvenile crime during the after-school hours, accurately reflects the timing of juvenile victimization, offending, and substance use experiences.

### **Limitations of Previous Research**

The literature review above provided a summary description of the existing research regarding the time when juveniles are most likely to offend or become a victim of crimes themselves. While this body of work has substantially contributed to an increased awareness of the timing of juvenile victimization and delinquency, this research generally exhibits five primary weaknesses.<sup>2</sup> These limitations are outlined below in detail. Each individual limitation is then utilized to provide a rationale for the subsequent research questions examined in the current study.

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<sup>2</sup> These five limitations apply to the body of research as a whole and are not applicable to any one prior study.

The first primary limitation of previous research is that it has relied on official police data and therefore fails to rule out the possibility that elevated levels of crime rates were due to law enforcement behavior rather than youth behavior. In other words, it may be that police are more likely to arrest juveniles during the after-school hours, which could explain the observed juvenile crime peak during these hours.

A second limitation is that previous research utilizing official police data, such as the FBI's UCR and NIBRS data, includes a select group of offenders since being arrested or having a criminal incident reported to the police is not perfectly related to committing an offense. Therefore, UCR data tend to underestimate the actual level of offending behavior since arrests are made in fewer than half of crime reported to the police (Snyder and Sickmund, 1999). In addition, while the NIBRS data is an improved measure of criminal activity because it includes information on all crime incidents reported to the police, the NIBRS data still has a few disadvantages. Primarily, NIBRS data is limited because it only includes information from jurisdictions that have agreed to participate in the system, unlike the UCR, to which all law enforcement agencies throughout the nation report. In 1999, only 2,852 (or 14.5 percent) of a total 19,659 jurisdictions participated in NIBRS (Jacob and Lefgren, 2003). Finally, the NIBRS data, as with all official crime data sources, is limited because it only includes those criminal incidents reported to the police.

The likelihood that official arrest data underestimates actual levels of crime seems to be supported by information obtained from victim reports. In an analysis of juveniles offending trends comparing victim survey data from the NCVS to official arrest data from the UCR, Lynch (2002:15) concluded that offending arrest rate estimates from the NCVS data are nine to 15 times greater than the arrest rate estimates from the UCR data. Additionally, crimes involving juvenile victims appear to be underreported in absolute terms and in comparison with adults (Finkelhor and Ormrod, 1999). In their analysis of 1997 NIBRS data from jurisdiction in 12 states, Finkelhor and Ormrod (2000a) observed that estimates of juvenile victimizations relative to their composition in the total population were less than estimates received from self-report sources. Accordingly, the authors suggested that police data in general and NIBRS data in particular are not good indicators of the true burden of crime victimizations by age group, but rather they are only the relative proportions of those victimizations that police are likely to encounter (Finkelhor and Ormrod, 2000a:5).

Juvenile crime and victimization reporting standards may be lower because it is likely that many criminal events occurring at school are handled directly by school personnel rather than being handled by official criminal justice agents. In a review of the NCS narratives, Garofalo et al. (1987:335) found the number of school related victimizations reported to school personnel exceeded the number reported to the police by a ratio of 100 to 68. In a more recent review of the 1995-1996 NCVS data, Finkelhor and Ormrod (1999) noted that school victimizations of



juveniles were less likely to be reported to police than non-school victimizations (15 percent and 37 percent, respectively).

However, Snyder and Sickmund (1999) referenced the 1996 NCVS data and noted that while approximately 19 percent of serious violent juvenile victimizations were reported to some other authority besides the police, only one-third of these incidents were subsequently reported to law enforcement. Consequently, when considering that approximately 33 percent of these incidents were reported directly to law enforcement, the police eventually learned of about 40 percent of serious violent juvenile victimizations (Snyder and Sickmund, 1999:27). While there are many plausible explanations for why juveniles are less likely to report crimes to the police, Finkelhor and Ormrod (1999) noted in their examination of the NCVS data that juveniles' underreporting was not totally explained by the tendency of juveniles to report crimes to school authorities rather than to police. The underreporting was evident even for the most serious offenses and even when taking into account reports to other authorities (Finkelhor and Ormrod, 1999).

Still, since a pattern of underreporting of crime by juveniles is apparent, some jurisdictions and school districts have begun to require the mandatory reporting of school crime to law enforcement officials. Generally state and federal statutes require that schools report any violent criminal acts (e.g. assault, homicide, child abuse) or possession of weapons or drugs to law enforcement officials.<sup>3</sup>

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<sup>3</sup> See generally, Gun-Free Schools Act of 1994, 20 USCA § 8921 (1999) (requiring reporting of firearms in schools); Safe and Drug Free Schools and Communities Act of 1994, 20 USCS § 7101 et seq. (1999) (requiring reporting of drug possession in schools and communities).

Lesser crimes such as property damage and vandalism may not come under a state's reporting requirement. In Maryland, the Code of Maryland Regulations (COMAR) 13A.08.01.15A states, "School officials shall promptly report to the responsible law enforcement agencies all delinquent acts coming to their attention whether occurring on or away from the school premises which involve students attending the particular school." However the next section, COMAR 13A.08.01.15B states delinquent acts "do not include conduct, which traditionally has been treated as a matter of discipline to be handled administratively by the particular school." Accordingly, Maryland school officials still maintain discretion over the types of delinquent acts reported to law enforcement officials and therefore police reports are still likely to underestimate juvenile crime rates, especially during the school day.

Although some previous research has incorporated self-report measures, a third limitation of this research is that it provides imprecise timing measures. For example, the main source of self-report victimization, the NCVS, asks respondents to estimate the time an event occurred in one of four time periods (6 a.m. to noon, noon to 6 p.m., 6 p.m. to midnight, and midnight to 6 a.m.). While this strategy provides a distribution of four equal time periods, this format is problematic because the first two periods overlap the time when juveniles are expected to be in school and therefore fail to provide an accurate description of in-school versus out-of-school crime. Recently, the NCVS, School Crime Supplement (SCS) has adapted the time references to further break down the periods into five reference categories (6 a.m. to noon, noon to 3 p.m., 3 p.m. to 6 p.m., 6 p.m. to 9 p.m., and 9 p.m. to

midnight). However, these subsequent time periods were only referenced for those victimizations occurring at school and therefore were unable to provide information about other victimizations that did not occur on school grounds (USDE, 2002).

The fourth limitation of previous research is that it has not adequately disaggregated the timing of juvenile offending behavior by specific types of crime. For example, the Snyder and Sickmund (1999) study only examined the timing of violent offenses and did not consider property crimes or alcohol and substance use by juveniles. However, previous research suggests a closer examination of all crime types may be necessary. In their systematic review of school victimizations, Gottfredson and Gottfredson (1985) found that more serious forms of juvenile victimization such as those resulting in serious physical injury or large monetary losses were rare in comparison to other more minor victimizations. Similarly, Garofalo and colleagues (1987:336) concluded from the NCS narratives that school related victimizations are peer related and grow out of factors such as bullying, injured pride, and misguided mischief and do not match the violent image of stranger to stranger street crime. Still, the authors contend that the regularity, with which adolescents do victimize each other, even if most victimization is more bothersome than injurious, warrants further attention.

In addition, existing research has focused more attention towards the timing of youth delinquency and has not adequately addressed the issues concerning when juveniles are more likely to be a victim of crime themselves. This pattern of focusing more resources toward the examination of juvenile delinquency may stem from a traditional criminal justice perspective in which our nation's youth are more

typically characterized as troublemakers and delinquents. While previous studies (e.g. Gottfredson et al., 2001; Jacob and Lefgren, 2003; Gottfredson and Soulé, 2003) have carefully examined the timing of juvenile delinquency, these works can be expanded by also including a closer examination of the timing of juvenile victimization and substance use.

The final primary weakness of previous research includes the inadequate examination of the frequency of juvenile victimizations and delinquent behavior in relation to the timing of these events. Little existing research has incorporated measures of frequency and therefore has been unable to make any statements about offenders who commit the same offense multiple times during the same time period. For example, it may be the case that the delinquency of high-rate offenders is only weakly related to the time of day, but that for lower rate offenders, the after-school hours are a peak time for delinquency (Gottfredson et al., 2001:80). Similarly, some victims may be susceptible to multiple victimizations at a particular time or some youth may repeatedly use substances such as tobacco, marijuana and alcohol at a particular time of day. Accordingly, a closer examination of the frequency of these repeat behaviors relative to the time the act is committed is justifiable.

### **Research Questions**

One of the major premises behind an increased interest in supporting after-school services is based on a body of prior research, which illustrated an apparent sharp peak in juvenile crime during the after-school hours. However, very recent research has presented somewhat contradictory evidence that juvenile offending and

victimization experiences may not be as elevated during these hours as previously suggested. The main goal of this study is to clarify our understanding of the timing of juvenile problem behavior by addressing some of the major limitations of previous research outlined above. Recall that the first three limitations of previous research were all related to the measurement issues. In particular, the use of official data and imprecise timing measures were cited as problematic. These limitations provide a clear starting point for an examination of the research questions described below. Accordingly, the first research question addressed in this study is:

When juvenile victimization, delinquency, and substance use behaviors are measured with more precise time measures using self-report data, are these behaviors more likely to occur during the after-school hours as suggested by previous research rather than during other times of the day?

As previously discussed, the NCVS data has been widely cited to explore timing patterns of juvenile victimizations and delinquency. Specifically, Howard Snyder and colleagues (Snyder and Sickmund, 1999; Sickmund et al., 1997) compared their findings regarding the timing of offending behavior from the NIBRS data with victimization reports from the NCVS in order to check if the actual pattern of crime against juveniles differed from the police data. Snyder and Sickmund (1999) cited the 1996 NCVS data, which highlighted an apparent peak in juvenile victimizations during the after-school hours. This finding confirmed the previous reports of increased juvenile crime activity during the after-school hours as found in the NIBRS data and has been widely cited as support for juvenile programs which increase supervision during these hours or provide alternative constructive activities

to keep youths off the streets. However, research which utilized the NCVS data to examine the timing of juvenile crime and victimization, failed to adequately address the inadequacies of the available timing measures.

Specifically, the NCVS asks victims to indicate in which of a day's four 6-hour blocks their victimization occurred. Of primary concern is the second six-hour block, which covers the period from noon to 6 p.m. Considering school usually dismisses somewhere between 2 p.m. and 4 p.m., the second time period covered by the NCVS includes a few hours of in-school time and a few hours of after-school time. Accordingly, those who suggest the NCVS data provides evidence that juveniles have an elevated risk of victimization during the after-school hours, should leave open the possibility that much of this crime may occur in the last few hours before school ends. While the NCVS School Crime Supplement (SCS) does disaggregate between the noon to 3 p.m. and 3p.m. to 6pm. hours, it is limited to reporting only those crimes occurring at school or on the way to and from school. Furthermore, additional data sources such as the YRBSS, which examine in-school versus out-of-school crime, do not refer to specific times beyond the school boundary. Therefore, these data sources are not particularly helpful for making definitive statements about the timing of juvenile crime and victimizations during after-school hours.

The first research question addressed the general timing of juvenile victimization, delinquency and substance use experiences by examining the aggregate measures provided in the data. However, in order to address the fourth

primary limitation of previous research regarding the inadequate examination of specific offenses, the second research question further expands on this analysis by asking:

Are specific victimization, delinquency, and substance use offense types related to the time the event occurs?

While prior research has contributed to our understanding of the timing of aggregate delinquency and victimization patterns, a closer examination of the NIBRS data suggests that while serious violent crime as a whole peaks for juveniles at 3 p.m., not all of the specific crimes included in this index peak at that same time. For example, the NIBRS data from 12 states indicated that the largest percentage of juvenile robberies took place around 9 p.m. (Snyder and Sickmund, 1999). Yet, as previously suggested, this data is limited to those offenses, which are captured through official police statistics. While an examination of these official records is beneficial, current research discussing the data available from these official records is mainly limited to an aggregate view of violent juvenile victimizations or offenses.

The fact that the NIBRS timing analyses focuses on only a few serious crimes is consistent with prior research trends. While an abundance of research has examined juvenile violent crimes (Cook and Laub, 2002; Shaffer and Ruback, 2002; Loeber, Kalb, and Huizinga, 2001; Hashima and Finkelhor, 1999), the criminal justice literature has paid little attention to juvenile property crimes. The lack of attention directed towards property offenses may be somewhat surprising considering recent NCVS data indicates that property crime is the most frequent

type of criminal victimization and more specifically the rate of property crimes against juveniles, ages 12-17 was approximately 40 percent higher in 1997 than the rate for adults (Finkelhor and Ormrod, 2000b). Additionally, to date, research has failed to adequately examine the time of day when juveniles are most likely to use alcohol or illegal substances, which may be of particular interest to parents and prevention practitioners.

If the timing of individual events is left unexplored, then the research may potentially miss important differences between unique events. For example, it may be the case that offenses that occur during a certain period of the day (e.g. during school) are relatively minor (e.g. thefts or vandalism) and those that occur during other hours (e.g. after-school) are more serious crimes, such as robbery or assault. Recently, one study did find a distinct difference between the types of crimes occurring in school and the types that occurred out of school. In their examination of NIBRS data from 29 jurisdictions, Jacob and Lefgren (2003) found that the level of property crime committed by juveniles decreased on days when school was in session, while the level of violent criminal offense among juveniles increased on school days. The authors concluded that when juveniles are not provided with a supervised environment (e.g. when out of school), they are likely to engage in anti-social behavior that manifests itself in increased property crime. However, when juveniles are in school, the authors argued that the geographic concentration of youth increased the number of potentially volatile interactions, which in turn explained the observed increase of in-school violent crime (Jacob and Lefgren, 2003:5). Accordingly, the research discussed above confirms the need for a more



thorough examination of a variety of crime types, including property crimes and alcohol/substance use.

Finally, the third research question was based on the last primary weakness of the existing research. To date, those analyses which examined the timing of juvenile victimization and delinquency, have not adequately examined frequency of these behaviors relative to the timing of these events. Accordingly, the third research question will expand this analysis by addressing the following question:

Are individuals more likely to be repeat victims, offenders, or substance users during different time periods than those observed for all incidents of these same behaviors?

The self-report survey used in this analysis has the advantage of allowing one to differentiate between those individuals who are single-incident offenders and/or victims versus those that are multiple or repeat offenders and/or victims. Therefore, this proxy frequency measure provides an opportunity for disaggregating individuals by their relative risk level.

Criminologists have long been aware of the fact that relatively few offenders are responsible for the majority of all crime incidents. However, the distribution of these incidents among victims has received less research attention (Lauritsen and Quinet, 1995). More recently, as victimization surveys developed, scholars noted that a relatively small number of victims accounted for a disproportionately large portion of victimization (e.g. Sparks, 1981). While some previous research has suggested that repeat victimization is rare (see Menard and Huizinga, 2001 for a review), recent analyses of other victimization surveys present contrasting results

suggesting the need to carefully examine victimization data and trends. For example, Menard (2000) examined data from nine waves of the National Youth Survey (NYS), encompassing the years 1976-1992 and respondents' ages ranging from 11 to 33 and found evidence in contrast to previous suggestions that most individuals report no victimization incidents. Rather, Menard (2000:558) reported that an average of about half of the NYS sample reported being victimized in any given year and furthermore, the average respondent experienced two victimizations per year. Menard and Huizinga (2001) further examined victimization data from the Denver Youth Survey (DYS) and found that 80 percent of youths who reported violent victimization were either chronic, multiple, or chronic and multiple victims of violent crimes. Similarly, Lauritsen and Quinet (1995) used longitudinal data from the NYS and found that most victims reported being the victim of more than one criminal incident within a one-year reference period.

Based on the evidence that repeat victimization is anything but rare and that both a small percentage of offenders and victims are responsible for a substantial proportion of all crime, it seems a further examination of the time of day when these repeat behaviors occur is warranted. For example, it may be that the victimization, delinquency, or substance use of high-risk (or repeat) juveniles is only weakly related to the time of day, but for lower risk juveniles, a specific time may be a peak period for victimization or delinquency. By examining this third research question, one should be able to determine the relative importance of differing time periods in relation to the frequency of juvenile offending, victimization and substance use.

In summary, this study carefully examines the relationship between juvenile offending behavior and the time when these events occur. The research agenda outlined above will provide some insight regarding the potential impacts of policy initiatives such as after-school programs. If the results confirm that juveniles are more at-risk when adult supervision is typically low (e.g. during the after-school hours), then one could suggest activities primarily designed to keep youth busy and “off the streets” hold promise as prevention tools.

Additionally, while not specifically tested in this study, the research does provide a foundation for the examination of the lifestyles and/or routine activities theoretical framework. The lifestyles theory presumes that some common activities of young people, such as staying out late, drinking, and using drugs, are more likely to place them in situations where the possibilities for victimization and delinquency are increased (Hindelang, Gottfredson, and Garofalo, 1978). Similarly, routine activities theory suggests that crime is more likely when a suitable target is available, a capable guardian is absent, and when a motivated offender is present (Cohen and Felson, 1979). Thus common lifestyles or “routine activities” shape criminal opportunities since areas with high crime rates are expected to be relatively unguarded locations where suitable targets and motivated offenders routinely interact. By exploring the time when juveniles are most likely to offend or become a victim of a crime themselves, this study will enhance our understanding of the nature and motivation of juvenile offending behaviors relative to the varying circumstances and levels of supervision juveniles typically experience throughout the day.

### **CHAPTER 3: RESEARCH METHODOLOGY**

The purpose of the following chapter is to discuss the methods used in this study. First, the data set for the study sample is described, followed by a discussion of the operationalization of the research constructs. Finally, the plan for analysis is discussed.

#### **Data**

The data used for this study are from an evaluation of the Maryland After School Opportunity Fund Program (MASOFP) administered through the State of Maryland's Department of Human Resources Child Care Administration from the inception of the initiative in July 2000 and currently administered through the Governor's Office of Children Youth and Families. In 1999, the Maryland General Assembly reacted to an increase in interest for addressing the after-school hours in order to reduce the number of hours youth spend unsupervised and passed the Maryland After School Opportunity Act (HB6) during the 1999 Legislative Session. The Act created the Maryland After School Opportunity Fund Program (MASOFP), which called for \$10 million to assist parents in providing after-school care and programs for children throughout the State (Maryland After School Opportunity Fund Advisory Board, 1999).

In August 2001, the University of Maryland was contracted to evaluate the services provided by the MASOFP-funded programs. The MASOFP initiative

supported services for approximately 260 after-school programs throughout the state during the 2002-2003 school-year. An outcome evaluation of 39 of these programs, serving youths in grades four through 12 began in September 2002. Each of the 24 counties in Maryland was expected to have at least one MASOFP site included in the evaluation. The number of sites per county selected to be included in the University of Maryland evaluation was calculated at a rate proportional to the total allotment of statewide funding.<sup>4</sup> The proportional sampling strategy for selecting sites to be included in the evaluation is provided in Appendix A.

Additionally, 10 of the 39 programs participating in the outcome evaluation recruited a sample of comparison group youth who did not regularly participate in an after-school program. Comparison group youths were expected to be matched to the MASOFP participants based on demographic characteristics, including grade level, race, and gender. The decision to incorporate the comparison group youth in this study's sample was based on the following rationale. First, the inclusion of youth in this comparison group increases the overall sample size which helps elevate the power of any statistical tests included in the analyses. Second, the larger sample size is beneficial for increasing the variability of the measures of interest, mainly juvenile victimization, delinquency, and substance use. Finally, an analysis of the pretest data was completed in order to identify any key difference between the

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<sup>4</sup> The outcome evaluation was originally scheduled to include 75 after school programs. However, in selected counties, the pre-post outcome evaluation never took place because many after school programs had difficulty in getting parental consent forms returned, which prevented the University evaluation staff from being able to administer the pre-test survey. However, all programs were still expected to participate in the process evaluation, which included submitting process data such as program attendance and staff information provider forms.

after-school participant group and those youth who were identified as comparison group participants. As discussed further below, these differences were minimal which further justified the inclusion of the comparison group in this study's sample.

The sample for the current study includes all evaluation participants from the 36 after-school programs in the overall University of Maryland evaluation sample, which served youth at the middle and high school levels (grades six through twelve). The middle and high school level students completed a longer survey instrument than the younger youth in the three evaluation programs, which served elementary school age children. The longer survey instrument included information about the timing of victimization and delinquency experiences, while the instrument for the younger youth did not include this feature.

This study uses data from the pre-tested questionnaires completed by the sample described above prior to or during the first few weeks of the program start dates. Programs start dates varied considerably across the State and ranged from September 2002 through March 2003.<sup>5</sup> Table 1 shows the pre-test response rates for the study's sample. Pre-test questionnaires were completed by 661 (56 percent) of the 1179 after-school participants, who received parental consent to participate in the MASOFP evaluation. Additionally, 221 youth were identified and received parental consent to participate as comparison group youth for the MASOFP evaluation. Pre-test questionnaires were completed by 156 (71 percent) of the

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<sup>5</sup> Although the pre-test administration dates varied over a seven-month period, the variation in survey dates should not be a concern for this study's analyses since the one-year reference period for the measures of interest (e.g. victimization, delinquency, and drug use) still remained a constant 12 months for all youth who participated in the study.

identified comparison group participants. Some potential study participants were not pre-tested because they were absent on the days the questionnaires were administered by the University of Maryland evaluation staff.

In order to determine the similarities and differences of the after-school participant group and the comparison group youth, comparisons were made on seven key measures including gender, race, age, grade, aggregate victimization score, aggregate delinquency score, and last year substance use. Although the sample size for the comparison group youth ( $n = 156$ ) is substantially smaller than the after-school participants group ( $n = 661$ ), analyses indicate that statistically significant differences existed for only two of the seven measures. As indicated in Table 2, the after-school participant group and comparison group were significantly different in terms of race whereby the after-school participant group included significantly more non-white youths than the comparison group ( $p < .01$ ). Additionally, the after-school participant group had a significantly lower average score ( $p < .05$ ) for the last-year substance use scale than the comparison group. No significant differences were found for the remaining demographic measures or the measures for last year victimization and delinquency. Since the current study is not designed to measure pre and post-test difference between these two groups, any pre-test discrepancies between the groups are irrelevant. Rather, the inclusion of the comparison group youth in all analyses is beneficial since their addition will only serve to increase the variability on the measures of interest in this study. Therefore, the final sample for this study includes a total of 817 evaluation participants who completed the pre-test questionnaires throughout the 2002-2003 school-year.

Table 3 presents a summary demographic description of the sample. The average study participant was a 12-year old, black female in the seventh grade. The sample included a group of youths (92.6 percent) who were mostly in middle school (grades six through eight), while the remaining students (7.4 percent) were in high school (grades nine through twelve). Forty percent of the students were male, with an average age of 12.35. The sample was 49 percent Black or African American, 42 percent White, 2 percent Latino, 1 percent Native American or Alaskan Native, 1 percent Asian American or Pacific Islander, and 4 percent of another race. Approximately one-third of the sample lived in a single-parent household and less than half lived in a traditional two-parent (mother and father) household. Slightly less than half (46 percent) of the middle school students and slightly more than half (51 percent) of the high school students in the sample received a free or reduced-priced lunch at school. In Maryland, the percentage of students receiving free or reduced priced lunches at school is often utilized as an assessment of a particular school or community's poverty level. On average, 33 percent of middle school age students and 20 percent of high school age students in Maryland received a free lunch at school during the 2002-2003 school year (Maryland State Department of Education, 2003), indicating that the current sample's poverty level is above average relative to the rest of the State. In total, the percentage of missing data did not exceed 2.1 percent for any of the variables or constructs included in the analysis. Consequently, missing data values are not common and cases with missing data values could be excluded without fear of serious miscalculations.



These data are used to describe the behaviors and characteristics of the evaluation participants with a specific focus on the timing of their victimization experiences, as well as their delinquent activities including alcohol/substance use. The current study does not attempt to assess the effectiveness of the after-school programs.<sup>6</sup> Additionally, the sample is not necessarily representative of any well-defined population. Rather, it is a convenience sample of juveniles in grades six through 12 who participated in the evaluation of the MASOFP initiative conducted by the University of Maryland.

It should be noted that one potential concern with using this type of sample is that after-school programs in general may attract a less victimized and less delinquent sample than a nationally representative sample of youth (Gottfredson et al., 2001). Much research has been conducted on after-school programs. However, the majority of these evaluations failed to account for selection bias. After-school programs may attract youths who already possess many of the necessary skills for healthy development while at-risk youth may stay away from after-school programs. Therefore, selection bias is a legitimate concern when one is evaluating the differences between youth in after-school programs and other youths because any observed effect may simply be an artifact of this selection bias.

Selection bias in this study's sample would be a legitimate concern if the goal was to examine the effects of an after-school program on the participant's potential problem behaviors. However, the aim of the current study is to examine the timing of juveniles' victimization, delinquency, and substance using behaviors

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<sup>6</sup> The evaluation of the MASOFP initiative is still in progress and a final report is due in June 2004.

and no attempts are made to examine the effect of after-school programs. Therefore any concerns regarding selection bias are immaterial to the objectives of this study.

Additionally, it is likely any potential selection bias is not so extreme as to result in the sample being free of adolescent victimization, delinquency and other related problem behaviors, which was the conclusion reached in a previous study which encountered a similar sample scenario (see Agnew, 2002). In addition, in their analyses of the National Youth Survey (NYS), Lauritsen and colleagues (1991:270) suggest even though victimization is statistically an uncommon event among most age groups, samples that focus exclusively on youth can be considered a “high risk” simply because of their focus exclusively on youth. It seems reasonable to suggest the same conclusion can be reached regarding offending behavior.

However, in order to assess the potential concern that this study’s sample may be biased towards “good youth”, an examination of the victimization, offending, and substance using rates in this sample are compared to the rates in other nationally representative samples of juveniles. In general, the rates for these behaviors reported by the current sample appear to be comparable to those rates reported by national samples using similar measures. In particular, the delinquency and last-year substance use measures can be directly compared to the sample from the National Study of Delinquency Prevention in Schools (NSDPS) study (Gottfredson et al., 2000) since the items measuring the delinquency and substance use scales in the current study were based on the same items used in the NSDPS sample. The NSDPS sample is a nationally representative sample of youths in

grades six through 12 and includes a sample of 16,318 juveniles' ages 11 through 18. The delinquency scale for both the NSDPS sample and the current study's sample has a mean score of 0.13 after the possible response values were recoded in the current sample to match the dichotomous (Yes/No) format utilized in the NSDPS sample. The average last-year substance use scores for the two samples were not as closely matched. The NSDPS sample has a higher mean score of 0.23 in comparison to the current study's mean score of 0.10. Although the NSDPS sample reports a higher average score for the last-year substance use measure, this may be partially explained by the demographic composition of the two different samples. The NSDPS sample included a higher percentage of white youths (68.2 percent) than the MASOFP sample (42.3 percent). Recent data from national surveys measuring juvenile substance use, such as the Youth Risk Behavior Survey (Center for Disease Control and Prevention, National Center for Chronic Disease Prevention, 2001) and the Monitoring the Future survey (Wallace, Bachman, O'Malley, Johnston, Schulenberg, and Cooper, 2002), have consistently shown that white juveniles report higher levels of substance use, especially alcohol use, than non-white juveniles.

However, given the difference in the mean substance use scale scores between the two samples, a further examination of the mean scores for all three of the behavior measures (i.e. victimization, delinquency, and substance use) among different demographic groups would help verify the reporting rates of the MASOFP sample to those reported in other nationally representative data. Furthermore, the legitimacy of the current study's sample is strengthened if the levels of delinquency

and drug use among respective demographic groups (e.g. whites and non-whites, males and females, and middle v. high school students) are similar to those reported in the NSDPS sample as well as those observed in prior research.<sup>7</sup> Appendix B presents the mean victimization, delinquency, and substance use scale scores aggregated by race, gender, and grade level. These data confirm the delinquency levels reported in the current study's sample by each of the respective groups are quite similar to those reported in the NSDPS sample. Furthermore, as one would expect based on other national data sources, both delinquency and victimization are elevated for non-white and male students.

However, the mean substance use scale scores are approximately half those reported by each of the respective groups in the NSDPS sample. This indicates, on average, the MASOFP sample reported substantially less substance use than the nationally representative sample. In addition, it does not appear the overall lower rate can be explained by the greater proportion of non-white students in the MASOFP sample. Contrary to what one would expect based on current national data, white students did not report higher levels of substance use relative to non-white students. However, the gender and grade level patterns are consistent with prior findings since males (0.11) and high school students (0.12) reported a higher average substance use score than their female (0.10) and middle school counterparts, respectively (0.10).

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<sup>7</sup> The means scale score for victimization can not be directly compared to any nationally representative sample since the seven individual items used in the current study's scale have not been incorporated by prior research.

The overall low scale score for last-year substance use in the MASOFP sample at first glance suggests the MASOFP sample likely under-reported their own substance using behaviors. However, since the average delinquency and victimization scales scores are consistent with those observed in other nationally representative samples, it is not clear why students would seem to truthfully report their own delinquent behavior while “holding back” regarding substance use.

A closer examination of the prevalence of juvenile substance use by the respondents’ ages suggests the MASOFP sample and NSDPS sample may not differ as much as it initially appeared. Appendix C presents the proportion of juveniles who reported any substance use in the past year for both of the respective samples by the age of the survey respondent. When one considers the prevalence of substance use by age, the rate of use by the two samples more closely mirrors each other. In fact, from age 11 through 14, the rates of substance use for the MASOFP sample are almost identical to those reported in the NSDPS sample. The rates diverge much more past age 15. However, the number of juveniles over age 15 in the MASOFP group is very small (n=48) and represents only six percent of the total sample. Furthermore, the average NSDPS participant was a 14-year old eighth grader. Accordingly, even when comparisons are made between the average substance use scores for middle school students in the two samples, the NSDPS middle school sample will consist of a group that is a full one-year older on average. As illustrated in Appendix C, 30 percent of MASOFP 12-year olds reported using any substance in the past year in comparison to 40 percent of 13-years olds. In summary, the lower average substance use scale score reported by the MASOFP

sample is being driven by the younger average age of the group as a whole.

Therefore, the apparent disparity in the reported substance use rates is not as severe as initially suspected and conclusions regarding the sample's substance using behaviors can be interpreted without fear of serious miscalculation.

Finally, five of the seven of the individual victimization items used in this study were adapted from the Denver Youth Survey (DYS) instrument (Huizinga and Esbensen, 1990). Therefore a comparison of the annual prevalence rates for victimization from the DYS is also appropriate. In general, the annual prevalence rates from the two samples are comparable. Menard (2000) reported that approximately half of the 1,530 youth in the DYS sample report any annual victimization, which is consistent with the current study's sample in which 56.5 percent of the sample report any victimization within a one-year time period.

In sum, the current study's sample may not be generalizable to any particular population of juveniles, however the sample's levels of delinquency, substance use, and victimization suggest the population cannot be considered a low-risk sample when compared to other nationally representative samples. Additionally, the current data set has the advantage of addressing many of the limitations of previous data sets previously discussed and can provide key information about the timing and circumstances of specific juvenile criminal events. Consequently, the potential benefits from examining the information contained in this sample, coupled with the general higher risk nature of a juvenile population, somewhat alleviates the potential concern of selection bias from the non-generalizable sample of after-school program evaluation participants.

## **Identification and Operationalization of Constructs**

The measures utilized in this study are operationalized from the respondent's answers to a series of questions asking about their own victimization, delinquency and substance use experiences as well as the timing of these individual events. The operationalization of the main variables of interest, which include juvenile victimization experiences, delinquent involvement, and substance use are described first, followed by a description of the operationalization of repeat victims, delinquents and substance users. The last section describes the operationalization of the timing of these individual events.

### **Victimization**

Victimization experiences were measured using respondent's answers to a variety of victimization questions. The victimization scale includes seven items adapted from the Denver Youth Survey (Huizinga and Esbensen, 1990). Each subject was asked how often any of the seven individual crimes had been committed against him or her in the past 12 months. The possible responses for each of these victimization items allowed the respondent to answer never, coded "0", once, coded as a "1" or two or more times, which was coded as a "2." This type of response category was utilized in order to provide a proxy measure for the frequency of each individual victimization item in order to address the third research question which addresses the occurrence of repeat victimizations. A further discussion of the operationalization of repeat victimizations is provided in a subsequent section.

The victimization scale includes questions which examine common juvenile victimization experiences such as being threatened with a beating, being hit by someone (simple assault), having someone use a weapon or strong-arm methods to get money or things (robbery), being attacked with a weapon or having someone trying to seriously hurt you (aggravated assault), having a pocket picked or wallet snatched, having things other than a wallet or purse stolen (theft), and having things damaged on purpose (vandalism). Responses to the seven individual victimization items were then averaged to produce a composite scale of juvenile victimization. The victimization scale has a possible range from zero to two, where “0” represents no juvenile victimization and “2” represents high juvenile victimization. Table 4 displays the descriptive statistics for each of the separate aggregate scale measures examined in this analysis. The aggregate victimization scale has a mean of 0.25, a standard deviation of 0.34, and a reliability of 0.73.

In order to examine the second research question, which is designed to analyze the timing of specific victimization experiences, the seven individual victimization items were also collapsed into two separate subcategories to provide a breakdown of personal crime victimization versus property crime victimization. Four of the seven items in the aggregate victimization scale measure the violent crimes of being hit by someone else, being threatened with a beating, being attacked with a weapon, and robbery. The four offenses can be considered proxy measures for simple assault, aggravated assault, and robbery, which constitute approximately 90 percent of all juvenile violent crime arrests (Cook and Laub, 2002). The remaining three victimization items measure the property crimes of pocket picking,



theft and having property damaged on purpose (vandalism). When these items are disaggregated by category of crime, the alpha reliability for the four-item violent crime victimization scale is 0.61, while the alpha reliability for the three-item property crime victimization scale is 0.57. Finally, the violent and property victimization scales were again broken down by each individual item, which provided a further disaggregation of victimization experiences by each specific crime. Table 5 displays the types of victimizations most frequently experienced by juveniles in this sample.

### Delinquency

Delinquent behavior was measured using respondent's self-reports to a variety of questions about offending behaviors. The aggregate delinquency scale included 10 items asking subjects how often they had engaged in any of these individual crimes in the past 12 months. This scale is based on a scale used by the researchers of the NSDPS (Gottfredson et al., 2000). The possible responses for each of these delinquency items allowed the respondent to answer never, coded "0", once which was coded as a "1" or two or more times, which was coded as a "2." Similar to the victimization items, this type of response category was incorporated in order to provide a proxy measure for the frequency of each individual delinquency item in order to address the third research question regarding the frequency of committing repeat offenses. A further description of the operationalization of repeat delinquency is provided in a subsequent section.

The delinquency scale items included commonly reported juvenile delinquent behaviors such as damaging or destroying property, stealing, carrying a hidden weapon, being in a gang fight, hitting or threatening to hit other students, joyriding, using strong-arm methods to get money or things from a person, and breaking into a building. Responses to the 10 individual delinquency items were then averaged to produce a composite scale of a respondent's delinquent behavior. The delinquency scale has a possible range from zero to two, where "0" represents no delinquent involvement and "2" represents high delinquent involvement. This aggregate delinquency scale has a mean of 0.20, a standard deviation of 0.30 and a reliability of 0.80.

In order to examine the second research question, which is designed to analyze the timing of specific criminal events, the 10 individual delinquency items were also collapsed into two separate subcategories in order to provide a breakdown of personal crime delinquency versus property crime delinquency. Four of the 10 items in the aggregate delinquency scale measure the violent crimes of carrying a weapon, gang fighting, hitting or threatening to hit a fellow student (simple assault), and using force or the threat of force to get property (robbery). The six remaining items measure the property crimes of vandalism, theft less than \$50, theft more than \$50, theft at school, joyriding, and breaking into a building or car. When these items are disaggregated by category of crime, the alpha reliability for the four-item violent crime delinquency scale is 0.60, while the alpha reliability for the six-item property crime delinquency scale is 0.75. Finally, the violent and property delinquency scales were again broken down by each individual item, which

provided a further disaggregation of delinquent events by each specific crime.

Table 6 indicates the percentage of youth who reported each type of delinquency in this sample.

### Substance Use

Juvenile substance use was measured using respondent's self-reports to a series of substance using behaviors. The aggregate substance use scale included five items asking subjects how often they had used each of these individual substances in the past 12 months. This scale is based on a series of questions used by the researchers of the NSDPS (Gottfredson et al., 2000). The possible responses for each of these substance use items allowed the respondent to answer never, coded "0", once which was coded as a "1" or two or more times, which was coded as a "2." This type of response category was incorporated in order to provide a proxy measure for the frequency of each individual drug use item in order to address the third research question regarding the frequency of committing repeat offenses.

The substance use scale items included smoking cigarettes, using smokeless tobacco, drinking beer, wine or "hard" liquor, smoking marijuana, and taking hallucinogens (such as LSD, ecstasy, mescaline, PCP, peyote, or acid). Responses to the five individual substance use items were then averaged to produce a composite scale of a respondent's substance use. The substance use scale has a possible range from zero to two, where "0" represents no substance or alcohol use and "2" represents high substance use. This aggregate substance use scale has a mean of 0.15, a standard deviation of 0.30, and a reliability of 0.67.

In order to address the second research question, which is designed to analyze the timing of specific criminal events, the five individual substance use items were examined separately in order to provide a disaggregation of substance use by each type of substance. Table 7 reports the percentage of juveniles who reported using each type of substance.

### Repeat Offenses

In order to examine the third research question, which explores whether higher-risk (or repeat-incident) individuals commit delinquent behavior or are the victims of crime at any specific time, the respective behavior measures were examined in order to assess the differences between the relative risk levels of individual victims, delinquents, and substance users. For the purpose of this study, the aggregate repeat measures include any time an individual reported being the victim of or committing any individual offense two or more times in the 12 months preceding the administration of the survey. Since an individual may have also reported two different victimization, delinquency, or substance use experiences, the repeat measure also includes those individuals who reported two or more different offenses that occurred during the same time period<sup>8</sup> (e.g. before school). Therefore a repeat aggregate victimization, delinquency, and substance use dichotomous measure was created for each individual where a no response was coded “0” and a

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<sup>8</sup> The repeat measure could only include individuals who reported two different offenses at the same time because the timing measure could not be computed if an individual reported these separate offenses at differing times.

yes response was coded “1.” Table 8 presents the breakdown of the number of individuals reporting any repeat victimization, delinquency, or substance use.

In order to examine the timing of repeat individual offenses, an analysis was performed to identify those individual events that were reported two or more times in the last year by at least five percent of the sample.<sup>9</sup> In total, four of the seven victimization items, four of the 10 delinquency items, and two of the five substance use items were reported as repeat incidents by at least five percent of the total sample.

#### Timing of Victimization, Delinquency, and Substance Use

This section discusses the operationalization of the timing of specific illegal behaviors. In order to address this study’s major objective of providing a more accurate understanding of the times juveniles are most likely to offend, use illegal substance, and/or be the victims of a crime themselves, this sample included a more precise measure of the timing of these dependent variables than previously employed in research with similar objectives. As previously stated, survey respondents were first asked to answer a series of individual questions about how often they either committed or were the victim of a variety of delinquency, substance use, and victimization offenses. Those respondents who answered “once”

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<sup>9</sup> The decision was made to limit the analyses of individual repeat offenses to the selected sample of offenses, which were reported by five percent or more of the total sample because the individual number of cases for these repeat events reported by less than five percent of the sample were too small to allow for sufficient variability of these events. The individual offenses which were reported by five percent or more of the total sample included: victim of hit by other, victim of threatened beating, victim of theft, victim of vandalism, involvement in gang fights, hitting or threatening to hit others, damaging other property, theft of less than \$50, cigarette use, and alcohol use.

or “twice or more” to any of the individual offense behaviors were asked to proceed to a corresponding timing grid which asked them to indicate the one time when they were most likely to commit each crime, use each substance, or be a victim of each respective crime. Respondents selected “Yes” (coded with a “1”) for a specific time period by marking the circle under one of the following time categories<sup>10</sup>:

- Weekdays, before school
- Weekdays, during school
- Weekdays, between when school lets out until 6 p.m.
- Weekdays, between 6 p.m. until midnight
- Weekdays, between midnight and 6 a.m.
- Anytime during the weekend

A blank response under any corresponding time period was coded “0” to indicate the juvenile did not commit a crime or was not a victim of a crime during this time period. At the same time, a blank response in a particular time period for a youth who indicated he or she committed or was a victim of a crime “twice or more” may indicate the youth selected an alternate time period in which he or she was more likely to have committed or been a victim of that particular crime.

Although this timing grid increased the complexity regarding the administration of survey, survey administrators read the entire survey aloud and were trained to ensure all survey participants understood the correct way to complete this section before proceeding. The added complexity of this section was necessary in order to provide more precise timing measures than were utilized in

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<sup>10</sup> Although it cannot be assumed that all youth have the same school schedule, the references to periods before, during, and after school should approximate fairly equivalent absolute time periods. In addition, the referenced time periods allow for the examination of the time when juveniles are most likely to be victimized, commit a delinquent act, or use illegal substances, relative to the school day, which is of particular interest to the current study.

similar analyses which examined NCVS data. In addition, these data should be able to provide a more accurate estimate of criminal events during specific time periods than official police data such as NIBRS, which may underestimate the true proportion of criminal events occurring during the school hours (Snyder and Sickmund, 1999).

### **Validity of Measures**

Whenever self-report data is used in any research design, a discussion of the validity of this self-report information is necessary. Self-report data are often used to enhance information obtained from official records. Self-report measures have been used considerably by researchers to gauge youth's delinquency and frequently demonstrated strong concurrent and predictive validity in relation to criteria such as juvenile court petitions (Farrington, Loeber, Stouthamer-Loeber, 1996). In addition, previous self-report studies have illustrated that young people are willing to report accurate information on both minor and serious delinquent activities (Espiritu, Huizinga, Crawford, and Loeber, 2001). Furthermore, self-report data on victimization experiences is often considered preferable to official police reports since a large proportion of victimization, especially juvenile victimization, goes unreported to the police.

Still, questions regarding self-report validity will always arise because of concern regarding whether respondents are telling the truth about their victimization experiences and delinquency participation. Previous research suggests that exaggeration (over reporting) is a greater concern than underreporting for self-report

surveys that cover the previous year (Elliott and Huizinga, 1989). However, the general conclusion from studies evaluating the validity and reliability of self-report is they compare favorably with other typical, accepted social science indicators (Hindelang, Hirschi, and Weis, 1981).

Since this study is mainly concerned with examining the specific timing of juvenile victimization and delinquency, it is particularly important to verify the validity of these outcome measures. One method for checking the validity of the self-report data used in this study is to examine the convergent validity of different scale measures, by examining the correlation between juvenile delinquency, victimization, and substance use. Since these aggregate scales generally measure an underlying latent trait of involvement in problem behavior and since previous research consistently finds support for a positive relationship between a variety of juvenile delinquent activities and victimization (Jensen and Brownfield, 1986; Lauritsen, Sampson, and Laub, 1991; Lauritsen, Laub, and Sampson, 1992; Esbensen and Huizinga, 1991), these three scales should be significantly correlated.

Appendix D presents the correlations for the aggregate victimization, delinquency, and substance use measures. An examination of the correlation between these three scales indicates they are significantly correlated. The victimization and delinquency scales have a statistically significant correlation of 0.418 ( $p < .001$ ), the delinquency and substance use scales have a statistically significant correlation of 0.616 ( $p < .001$ ), and finally the victimization and substance use scales have a statistically significant correlation of 0.223 ( $p < .001$ ). Additionally, all three scales have statistically significant correlations ranging from



-0.504 to -0.186 with the constructs commitment to education, belief in rules, and positive peer influence (correlations not shown), which previous research has shown to be related to lower levels of delinquency and substance use (Gottfredson et al., 2001), as well as victimization (Loeber et al., 2001).

### **Plan for Analysis**

As noted earlier, the majority of previous research suggests juvenile victimization and offending peak in the hours immediately after-school concludes, generally including the hours from 3 p.m. to 6 p.m. However, the previously discussed limitations of these studies suggest more precise timing measures are necessary in order to confirm or refute these previous findings. This study utilized an improved research design aimed at addressing these limitations and employs the analytic strategy described below in an attempt to address the research questions outlined in the previous chapter.

In order to address the first research question, which seeks to review whether juvenile victimization and crime in general is more likely to occur during the after-school hours, the following three hypotheses are examined:

H<sub>1a</sub>: Juveniles are more likely to be victimized during the after-school hours, as opposed to the other five time periods.

H<sub>1b</sub>: Juveniles are more likely to commit a delinquent act during the after-school hours, as opposed to the other five time periods.

H<sub>1c</sub>: Juveniles are more likely to use illegal substances during the after-school hours, as opposed to the other five time periods.

The rationale for these first three hypotheses is based on the previously reviewed literature, which largely outlined an apparent peak in juvenile crime and victimization during the after-school hours. Since many juveniles are typically unsupervised during these hours, the declared association between the after-school hours and subsequent problem behavior seems logical. However, the limitations of prior research suggest a further examination of whether the observed peak in juvenile victimization, delinquency, and substance use during the after-school hours remains after more precise timing measures are employed using a self-report design.

In order to address the second research question, regarding the timing of specific victimization, delinquency, and substance use behaviors, the aggregated measures were disaggregated to provide a closer examination of these individual events. Since the most widely cited research by Snyder and colleagues (1999) suggests juveniles are most susceptible to violent crime during the after-school hours, the following two hypotheses are examined:

H<sub>2a</sub>: Juveniles are more likely to be the victim of a serious crime (or violent offense) during the after-school hours, as opposed to the other five time periods.

H<sub>2b</sub>: Juveniles are more likely to commit a serious delinquent act (or violent offense) during the after-school hours, as opposed to the other five time periods.

These hypotheses are general statements based on the current expectation that all juvenile crime and victimization is elevated during the after-school period. However, a detailed exploration of a greater range of offense seriousness, including property offenses, is explored.

These first five hypotheses are all examined in a similar fashion. Since the dependent variables (measures of victimization experiences, delinquent acts, and substance use) are categorical, a chi-square test was employed as the primary statistical analysis tool in order to determine if the number of incidents of victimization, delinquency, and substance use observed in each specific time period was significantly different from the expected proportion given an assumed random distribution and a proportionate distribution equal to the hours contained in each time period. The first step in the analysis is to report the proportion of youth who indicated being victimized or committing a delinquent act in each of the six possible time periods. These proportions are then standardized by the number of hours included in each time period and provide a general overview of which time periods are the most or least likely to produce a juvenile victimization or delinquent act relative to the number of hours included in each time period.

For all analyses, the number of hours per week included in each separate time category was the following:

- Weekdays, before school: 2.5 hours per day for 5 days = 12.5 hours, which is **7.44** percent of the hours in each week.
- Weekdays, during school: 6 hours per day for 5 days = 30 hours, which is **17.86** percent of the hours in each week.
- Weekdays, between when school lets out until 6 p.m.: 3.5 hours per day for 5 days = 17.5 hours, which is **10.42** percent of the hours in each week.
- Weekdays, between 6 p.m. until midnight: 6 hours per day for 5 days = 30 hours, which is **17.86** percent of the hours in each week.
- Weekdays, between midnight and 6 a.m.: 6 hours per day for 5 days = 30 hours, which is **17.86** percent of the hours in each week.
- Anytime during the weekend: 24 hours per day for 2 days = 48 hours, which is **28.45** percent of the hours in each week.

The analyses were then refined to more specifically examine the observed number of individuals who reported each specific victimization and delinquent offense type in each time period in comparison to the number that would be expected under the assumption of (a) random distribution of victimization and offending over the six unique time periods and (b) the distribution of victimization and offending over the time periods that is proportionate to the number of hours contained in each time period. In order to determine if a particular time period significantly predicts a particular event, these analyses were limited to those individuals who reported being victimized, committing a delinquent act, or using an illegal substance at least once in the past 12 months<sup>11</sup>.

A nonparametric (1 x 6) one-sample Chi-square test was calculated for all of the aggregated and disaggregated dependent variable measures to compare the observed frequency of each event within each of the six time periods with the expected frequency of each event within each time period. Nonparametric tests are primarily used with populations that are not normally distributed and are also used to conduct statistical tests if the assumption of normality is violated (George and Mallery, 2001). In this analysis, a nonparametric Chi-square test is appropriate for those analyses which assume the expected frequency within each time period is relative to the number of hours included in that time period as outlined above.

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<sup>11</sup> In all cases, the results from the Chi-Square analyses under the assumption of equal distribution of the behaviors over the six time periods produced similar results to the analyses assuming a distribution that was proportional to the number of hours contained in each time period. Therefore, relevant tables display only the latter Chi-Square test statistic and results are interpreted based on the assumption that the expected percentages are computed proportionally to the number of hours contained in each time period.

Accordingly, if the observed Chi-square ( $\chi^2$ ) tests exceed the critical Chi-square ( $\chi^2$ ) of 15.086 (df= 5,  $p < .01$ ), then there is evidence that the observed number of incidents of a particular event (e.g. violent victimization) across the six time periods is statistically different than the expected number if these incidents were distributed proportionally to the number of hours in each time period. The probability value of .01 utilized in all statistical tests in this study is a generally accepted threshold for statistical significance and indicates that the difference in the observed number of incidents within the six time periods could happen by chance less than one percent of the time. In order to address the final research question regarding repeat victims, offenders, and substance users, the following three hypotheses are examined:

- H<sub>3a</sub>: Juveniles are more likely to be a repeat victim during the after-school hours, as opposed to the other five time periods.
- H<sub>3b</sub>: Juveniles are more likely to be a repeat offender during the after-school hours, as opposed to the other five time periods.
- H<sub>3b</sub>: Juveniles are more likely to be a repeat substance user during the after-school hours, as opposed to the other five time periods.

These last three hypotheses are explored because previous research has failed to adequately examine the time when particular levels (i.e. repeat or higher risk) of offenders and victims are most likely to offend or be the victim of a crime themselves. After the data were manipulated to create proxy measures for repeat victimization, delinquency, and substance use (as described in Chapter 3), these last hypotheses were examined utilizing the same plan for analysis as described above.

One potential complication with the analytic strategy employed to address all of the respective hypotheses arises if respondents reported being victimized or committing a delinquent act in more than one time period.<sup>12</sup> A further examination of an “overlap” in the reporting of any victimization or delinquent act in more than one of the six time periods examined is necessary because this overlap in reporting would violate the independence assumption required by the chi-square test. The percentage of cases that reported victimization experiences, delinquent activities, or substance use in multiple time periods varied in each offense category: 38.4 percent of those who reported any victimization, 45.9 percent of those who reported any delinquency and 22.8 percent for those who reported any substance use. Overall, 49.8 percent of those who reported any offense (victimization, delinquency, and/or substance use) reported it at multiple time points. Accordingly, separate analyses that both included and excluded these overlapping cases were conducted in order to address this potential complication. The separate analyses were then examined in order to determine if the outcomes obtained in the analyses that included the overlapping cases differed from the analyses that excluded these cases. In all cases, the results from the more conservative method of eliminating those who responded in multiple time periods were similar to results from the analyses using all cases. Therefore, only the latter results are presented in the next section.

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<sup>12</sup> This potential complication is eliminated in the offense-specific analyses since the respondent is reporting the timing for one individual offense in contrast to the analyses of the aggregated measures in which a respondent may report separate offenses during different time periods.

## **CHAPTER 4: RESULTS**

This chapter reports the results of the analyses conducted for this study. In order to address the first research question, the first three sections discuss the results of the timing analyses for the aggregated offense measures. The second research question is first addressed in the fourth section, which reports the results of the analysis for the timing of the violent and property subcategories for victimization and delinquency. A further exploration of the second research question is provided in the fifth section, which discusses the results of the analyses for each of the individual offense behaviors. Finally, the last section addresses the final research question by reporting the results of the examination of repeat offenses.

Recalling the first research question asked whether juvenile victimization, delinquency, and substance use behaviors were still more likely to occur during the after-school hours after utilizing more precise timing measures than employed in previous research, the first group of analyses focused on the general timing of the aggregate behavior measures.

### **Timing of the Aggregate Victimization Measure**

In order to get a sense of the underlying relationship between juvenile victimization and the timing of these events (as addressed in hypothesis 1<sub>a</sub>), it is useful to begin by looking at the raw data. As indicated in Table 5, 462 (56.5 percent) of the sample reported being the victim of any type of victimization at any

time. The number of individuals reporting any victimization may seem surprisingly high. However, as previously noted this rate is similar to the rate of victimization reported by Menard (2000) in his examination of the NYS sample (which used many of the same measures), who found that roughly 50 percent of the sample reported being the victim of a crime in any given year. An additional breakdown of the timing of juvenile victimization is provided in the first row of Table 9, which indicates the number and percentage of juveniles who reported being the victim of any type of crime during each of the six time periods. The largest proportion of juveniles (32.6 percent) reported being the victim of any type of victimization during the school hours. The next highest period for any victimization was during the after-school hours (18.0 percent), followed by the weekend period (17.7 percent) and from 6 p.m. to midnight (6.9 percent) respectively.

These raw percentages provide a basic understanding of what time periods provide the largest absolute number of victimizations for the total sample's population. For example, based on the data presented above, we know that the largest number of juveniles reported being victimized during the school day. However, it is also interesting to consider the relative proportion of victimizations in each time period after controlling for the actual number of hours contained within each time period. In this scenario, one can consider the likelihood of victimization in each time period relative to the amount of actual time available for one to become a victim in each period. Figure 1 shows the proportion of juveniles who reported being a victim of any type of crime in each time period after the proportions were standardized relative to the number of hours in each time period. Using this analytic



strategy, juveniles were still most likely to be victimized during school, however the gap in the proportion of juvenile victimizations reported during school and after-school hours is smaller than that observed in the raw proportions. Additionally, the standardized proportions indicate the likelihood of victimization for juveniles was greater before school than during the weekend, considering the before school period contains approximately one-fourth (12.5 hours) of the actual numbers of hours included in the weekend period (48 hours).

However, the main goal of this study is to determine the timing of the victimization (or delinquency/substance use) for those individuals who actually experienced these behaviors. Accordingly, hypothesis 1<sub>a</sub> is further examined in a final analysis of the timing of the aggregate victimization measure, which is limited to the total number of individuals who reported one or more victimizations (n = 686) in each of the six separate time periods.<sup>13</sup> Table 10 displays the observed percentage distribution of victimizations reported in all six time periods for those individuals who reported one or more victimizations. Among those individuals who reported any victimization, the largest portion of victimization experiences (38.8 percent) was reported during school hours, followed by the after-school hours (21.4 percent) and during the weekend (21.2 percent) respectively.

The Chi-square ( $\chi^2$ ) statistic reported on Table 10 tests for the independence of each type of victimization across time periods, after adjusting for the different

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<sup>13</sup> The number of cases (n=686) for this analysis is larger than the number of cases (n=462) for those individuals who reported any victimization at all because individuals who reported one or more victimization experiences in different time periods are included in each time period for which they reported being victimized. For example, an individual who reported being the victim of theft during school and a victim of vandalism after school would be counted in both time periods.

number of hours in each period to assume an expected distribution of victimization proportional to the number of hours in each period. The obtained  $\chi^2$  value of 378.9 exceeds the critical  $\chi^2$  of 15.1 (df= 5,  $p < .01$ ) indicating that victimization varies significantly by time period. The figures in parentheses on the table provide the difference between the observed percentage of youth who reported any victimization and the expected percentage of youth who reported any victimization for each time period under the assumption that the percentages will be distributed proportionally to the number of hours in each period. For example, the observed percentage of victimized juveniles who reported any victimization during school exceeds the expected percentage for any victimization during school by 20.9 percent providing further evidence that juveniles were more susceptible to victimization during school hours than during any other time. Any victimization was also elevated during the after-school hours (+11.0 percent) and was depressed in the four remaining time periods.<sup>14</sup>

### **Timing of the Aggregate Delinquency Measure**

An examination of the raw data for juveniles regarding their levels of aggregate delinquency indicates 449 (55.0 percent) juveniles reported committing

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<sup>14</sup> Not surprisingly, victimization was depressed in the midnight to 6am period when most juveniles in this study's age range (10-17) are typically sleeping. In fact, for all the subsequent analyses, each of the observed behaviors were depressed during this time period relative to the expected proportion of cases if they were distributed proportionally to the number of hours contained in each period. One might argue the observed timing patterns would be altered if these analyses were executed without this midnight to 6am period. However, this time period still remains a viable option for youth to report offending behavior even if most juveniles would not report any at this time. Furthermore, since only two to three percent of each of the various offenses are reported at this time, neither the observed timing patterns nor the variation of these behaviors across time would be substantially altered by the exclusion of this one time period.

one or more delinquent acts at any time (see Table 6, first row). Similar to the percentage of juveniles who reported any victimization, the rate of delinquency is higher than might be expected primarily because of the inclusion of the “hit or threatened to hit other students” item. In total, 45.7 percent of the survey respondents reported committing this offense. A further dissection of juveniles’ aggregated delinquency, relative to timing of their offending behavior (as addressed in hypothesis 1<sub>b</sub>), is provided in Table 9 (row four). A similar pattern regarding the timing of juvenile victimization is found for the aggregate delinquency measures. The largest number of juveniles (n=319, 39 percent) reported committing one or more delinquent acts during the school hours. Juveniles were next most likely to report a delinquent act during the weekend (19.6 percent) followed by the after-school hours (18.8 percent). The remaining three time periods contained a fairly equivalent percentage of youths reporting delinquent acts.

In order to consider the relative proportion of delinquency in each time period after controlling for the number of hours contained within each time period, Figure 2 displays the proportion of juveniles who reported committing any delinquent act in each time period after the proportions were standardized. When the distribution of delinquency was standardized by the number of hours in each period, juveniles were still most likely to be delinquent during the school hours. However, juveniles were next most likely to commit a delinquent act during the after school hours considering the relatively little amount of time contained within this period.

Finally, hypothesis 1<sub>b</sub> is further addressed by examining the timing of delinquent behavior across the six time periods for those individuals who actually reported these behaviors. Therefore the next analysis was limited to the total number of individuals who reported committing one or more delinquent acts in each of the six separate time periods.<sup>15</sup> The first row of Table 11 displays the observed percentage distribution of delinquent acts reported across the six time periods. Among those individuals who reported any type of delinquency, the largest portion of delinquent acts (42.4 percent) was reported during school hours. The obtained  $\chi^2$  value of 486.2 exceeds the critical  $\chi^2$  of 15.1 (df= 5, p < .01) indicating that delinquency varies significantly by time period. An examination of the differences between the actual and expected proportions of delinquency for each time period, where the expected proportions are computed assuming they are distributed proportionally to the number of hours in each period, indicates delinquency is most prominent during school (+24.5 percent), followed by the after school hours (+10.1 percent), while delinquency is depressed before school, during the weekends, and during the evening and late night hours.

### **Timing of the Aggregate Substance Use Measure**

An examination of the raw data for the aggregate substance use measures indicates 249 (30.5 percent) juveniles reported using any illegal substance at any

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<sup>15</sup> Individuals who reported one or more crimes in different time periods are included in each time period for which they reported committing a crime. Therefore, the number of cases for this analysis equals 753, indicating some of the 449 individuals who reported any delinquency committed an offense in multiple time periods.

time (see Table 7). In order to address hypothesis 1<sub>c</sub>, the timing of these substance use behaviors is provided in last row of Table 9, which indicates the number and percentage of juveniles who reported using any substance during each of the six time periods. The largest proportion of juveniles (17.0 percent) reported using any type of substance during the weekend. The next highest period for juvenile substance use was during the after-school hours (7.5 percent), followed by the period from 6 p.m. to midnight (7.2 percent) and finally during the before school period (3.1 percent). Juvenile substance use was reported by less than two percent of the sample during school and from midnight to 6 a.m.

In order to gain a perspective of juvenile substance use relative to the number of hours in each period, Figure 3 illustrates the standardized proportion of juveniles who reported using substances in each time period. After standardizing the raw proportions of individuals who reported any substance use in each time period, the data indicate the proportion of juveniles who reported using any type of substance after school (0.43) was slightly greater than those who reported using any substance during the weekend (0.35).

Finally, hypothesis 1<sub>c</sub> was further examined in the next step in the analysis, which compared juvenile substance use across time periods for those individuals who admitted using any substance in the 12 months prior to the administration of the survey. Accordingly, the next analyses were limited to the total number of juveniles who reported using any type of substance one or more times in any of the

six time periods.<sup>16</sup> As displayed in Table 12, the obtained  $\chi^2$  value of 124.1 exceeds the critical  $\chi^2$  (df= 5,  $p < .01$ ) of 15.1, indicating that substance use varies significantly by time period for these individuals. An examination of the percentages reported in parentheses on Table 12 indicates the difference between the observed percentage of youth who reported any substance use versus the expected percentage of youth who reported any substance use was largest during the weekend period (+16.6), followed by the after school hours (+9.4), from 6 p.m. to midnight (+1.3), and before school (+0.7) when the expected percentages are computed assuming all substance use experiences were distributed proportionally to the number of hours in each time period. Accordingly when the analyses were limited to those individuals who reported using any substance, the weekend period replaces the after school period as the most common time for juveniles to report using any substance. The after-school hours are still an elevated period for juvenile substance use, but the difference between the observed and expected percentage is not as large as the difference reported for the weekend time period. It should also be noted that in contrast to victimization and delinquency, juveniles were substantially less likely to use any substance during the school hours.

In summary, the above results addressed the first three research hypotheses by examining the timing of the aggregated juvenile victimization, delinquency, and substance use measures. Contrary to the central position asserted in each of the

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<sup>16</sup> Individuals who reported using one or more substances in different time periods are included in each time period for which they reported substance use. Therefore, the number of cases for this analysis (n=308) indicates some of the 249 individuals who reported any substance use, used substances in multiple time periods.

related hypotheses, juveniles were generally not more likely to report any of the aggregated offense measures during the after-school hours. In each case, the data were examined from a few different perspectives. In general, all analyses suggested that both victimization and delinquency are most likely to be reported during school hours, while substance use is most commonly observed during the weekend hours. However, important differences in specific types of offenses may have been minimized due to the aggregation of the offense measures. Therefore, the following sections provide a more detailed exploration of the individual offenses embedded in these larger measures.

### **Timing of Violent and Property Offenses**

In order to address the second research question (and hypotheses 2<sub>a</sub> and 2<sub>b</sub>) which called for a more detailed exploration of the different types of victimization and delinquency, separate analyses were conducted for each subcategory of victimization and delinquency (i.e. violent and property) in addition to analyses for each individual offense type within these subcategories (e.g. victim of robbery, theft of more than \$50, and alcohol use). The results for the analyses of the timing of the violent and property subcategories are presented immediately below, while the results of the analyses for each individual offense type are presented in the subsequent section.

### Violent Victimization

An examination of the raw data is a useful starting point for the exploration of the underlying relationship between juvenile violent victimization and the timing of these events. Table 5 presents the number and percentage of youths reporting all types of victimization at any time. As shown in the second row, 338 (41.4 percent) of the sample reported being the victim of any violent victimization in the 12 months preceding the survey. The rate for violent victimization appears particularly high which is primarily due to the simple assault or “hit by someone” item. In total, 32.6 percent of the sample reported they had been a victim of this offense, which should not be entirely surprising since slightly less than half of the sample reported hitting or threatening to hit other students themselves. Table 9 indicates the number and percentage of youths reporting any offense by type of offense and time period. It is evident by these raw percentages that juveniles are most likely to be the victim of a violent crime during school hours (17.9 percent).

Recalling the main goal of this study is to determine the timing of the various juvenile behavior experiences for those individuals who experienced these behaviors, the next analysis regarding the timing of violent victimization addresses hypothesis 2<sub>a</sub> and is limited to the total number of individuals who reported any violent victimization (n = 422) in each of the six separate time periods. Referring back to Table 10, one can observe that among those who reported any violent victimization, the largest portion of violent victimization experiences (34.6 percent) was reported during school hours, followed by the after-school hours (25.8 percent)



and during the weekend (21.6 percent). This is the same pattern that was observed for the measure of total victimization.

The observed Chi-square ( $\chi^2$ ) value for violent victimization reported on Table 10 of 238.8 exceeds the critical  $\chi^2$  of 15.1 (df= 5,  $p < .01$ ) indicating that violent victimization varies significantly by time period. An examination of the differences between the observed percentage of youth who reported any violent victimization and the expected percentage of youth who reported any violent victimization for each time period under the assumption that the expected percentages will be distributed proportionally to the number of hours in each period also indicate that juvenile violent victimization is most prominent during the school hours (+16.7 percent), followed closely by the after-school hours (+15.4 percent). Relative to their expected percentages, violent victimizations are depressed in the four remaining time periods.

#### Property Victimization

While total victimization and violent victimization presented nearly identical timing patterns, the distribution of property victimization across the six time periods presents a slightly different picture. Starting with the raw percentages shown in Table 5, the data indicate that 333 (40.8 percent) of the survey respondents reported being the victim of one or more property victimizations at any time. A further dissection of property victimization by time period (displayed in Table 9) indicates the largest percentage (20.9) of youth reported being the victim of a property crime during the school hours. However, for the first time in relation to all juvenile

victimizations, the percentage of juveniles who report any property victimization is next highest during the weekend (11.3 percent).

Recalling hypothesis 2<sub>a</sub> explores the timing of differing severity levels of victimization, the next step in the analysis was to compare property victimization across time periods for those individuals who reported being the victim of one or more property crimes in the 12 months preceding the survey. Among all types of victimization, property victimizations show the most variability across time. This is indicated by the range of observed percentages reported across the six time periods as well as the difference in observed and expected percentages reported in parentheses in the last row of Table 10. This table shows property victimization is extremely high during the school hours as 42.9 percent of all observed property victimizations occur during this time frame. A substantial portion of observed property victimizations was also reported during the weekend hours (23.1 percent), however this effect is diminished when compared to the expected percentage relative to the larger number of hours contained in the weekend hours. In other words, when one considers the weekend period contains 48 hours, the difference between the observed percentage and the expected percentage reveals that property victimization is actually slightly depressed during the weekend (-5.4 percent).

### Violent Delinquency

Table 6 presents the number and percentage of youth reporting all types of delinquent acts at any time. As shown in the second row, 398 (48.7 percent) juveniles reported committing a violent delinquent act at any time in the 12 months

preceding the survey administration. An examination of the timing of violent delinquency in Table 9 reveals that 35.4 percent of the sample reported a violent delinquent act during the school hours while 10.4 and 10.3 percent reported committing a violent crime during the weekend and after-school periods, respectively.

In order to examine hypothesis 2<sub>b</sub>, the analysis of the timing of violent delinquency for those individuals who admitted committing one or more violent crimes is presented in Table 11. Among all types of delinquency, violent delinquency shows the most variability across time and violent crimes are extremely high during the school hours. In fact, the difference in the observed percentage versus the expected percentage (+37.0) if these crimes were distributed proportionally to the number of hours in each period is almost seven times greater than the difference reported for the only other period when violent delinquency is elevated, the after-school hours. These numbers are primarily driven by the “hitting or threatening to hit other students” item, as 34 percent of the total sample admitting to committing this offense during school hours suggesting that among this selected sample, fighting during the school day is highly prevalent.

### Property Delinquency

With the exception of the aggregate substance use measures, the results so far have consistently suggested that among those juveniles who reported involvement in any of the behaviors discussed, the hours during school are the most troublesome. However, the 269 (32.9 percent) juveniles who reported committing a

property delinquent act at any time in the 12 months prior to the survey indicated they were more likely to commit a property delinquent act during the after-school and weekend hours, at least in terms of raw percentages. Referring back to Table 9, the largest number of survey respondents reported property delinquency during the weekend ( $n = 119$ , 14.6 percent) and after-school hours ( $n = 95$ , 11.6 percent).

However, among those juveniles who reported one or more property delinquent acts, the greatest difference in the observed percentage of juveniles who reported these acts versus the expected percentage occurs in the after school hours (14.9 percent), assuming the expected percentages were distributed proportionally to the number of hours in each time period (see Table 11). Property delinquency is also elevated during school and weekend hours, but the observed percentages are not as great when compared to the after-school hours.

### **Timing of Individual Offenses**

Recalling the second research question also called for the examination of the timing of specific victimization, delinquency, and substance use offenses, the next set of analyses also addressed hypothesis 2<sub>a</sub> and 2<sub>b</sub> by providing an exploration of the independent samples of youth who committed each specific type of behavior. Since the previously presented results focused on the aggregate measures of victimization, delinquency, and substance use as well as the violent and property subcategories, it is perhaps not surprising that little variability in the timing of these events existed. However, it was significant to find these behaviors are generally most likely to occur during the school hours, as opposed to during the after-school

hours as consistently found in prior research. Accordingly, it is appropriate to explore the timing of the individual items contained within each encompassing measure to identify those offenses, which are driving the observed aggregated results as well as to determine which behaviors diverge from the previously acknowledged patterns.

### Individual Victimization Offenses

Table 5 illustrates how often juveniles reported being the victim of each of the seven individual victimization offenses at any time. Among the four violent victimization offenses, the most common victimization experienced by juveniles was simple assault (32.6 percent), followed by being threatened with a beating (20 percent). The more serious violent victimization offenses, including aggravated assault and robbery were each reported by less than 7.5 percent of the sample. The bottom portion of the table, which includes the three individual property victimization offenses, indicates the most common type of these less serious offenses was being the victim of a theft (32.9 percent), followed by victim of vandalism (17.9 percent) and victim of a pocket pick (10.3 percent).

Tables 13 and 14 present the results of the timing analyses, which focused only on those individuals who reported each separate victimization offense. Table 13 indicates the observed percentage of incidents for each individual violent victimization offense within each of the six time periods for those individuals who reported being the victim of each respective offense. For all four individual violent victimization offenses, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 (df= 5,

$p < .01$ ) indicating each individual violent victimization offense varies significantly by time period.

An examination of the distribution of the observed percentages across the six different time periods for each offense reveals an interesting scenario. For the individual victimization offenses of robbery and simple assault (i.e. hit by someone), the largest percentage of victimization incidents was reported during the school hours, 35.2 and 40.3 percent respectively. Considering the largest number of observed incidents for any individual victimization offenses was reported for the simple assault offense during the school period, it is evident this particular offense is mainly responsible for the timing pattern observed in the larger total victimization and violent victimization aggregated measures.

Comparatively, the largest observed percentage of aggravated assault (or attacked with weapon) and threatened beating victimization incidents were reported during the weekend period (39 and 26.3 percent respectively). However, when examining the differences between the observed percentages and the expected percentages (shown in parentheses), both victim of an aggravated assault and victim of a threatened beating are most prominent during the after school hours.

Table 14 displays the observed percentage of incidents for each individual property victimization offense within each of the six times periods for those individuals who reported being the victim of each respective offense. For all three individual property victimization offenses, the  $\chi^2$  test is statistically significant indicating each individual property victimization offense varies significantly by time period.

An examination of the distribution of the observed percentages for the three property victimization offenses across the six different time periods for each offense reveals the largest percentage of pocket picking (49.4 percent) and theft victimization incidents (54.5 percent) was reported during school hours, while the largest percentage of vandalism victimization incidents was observed during the weekend (33.1 percent). When examining the differences between the observed percentages and the expected percentages (shown in parentheses), vandalism victimization incidents become most elevated during the after school hours after considering the relative number of hours contained in each of the six time periods. In sum, simple assault victimizations are extremely high during the school day while aggravated assault and threatened beating victimization offenses are most prominent during the after school hours. Consequently, it is important to note that for the first time in this study, the previously observed pattern of escalated victimization during the school day does not hold true for all individual offenses. This pattern is further reviewed in the discussion of results presented in Chapter 5.

#### Individual Delinquency Offenses

Table 6 shows how often juveniles in the current sample reported committing each of the 10 individual delinquency offenses at any time. Among the four violent delinquency offenses, the most common offense committed by juveniles by far was simple assault (45.7 percent). The next most commonly reported violent offenses were involvement in gang fights (13.5 percent), carrying a weapon (8.9 percent) and robbery (6.5 percent). The reporting rates for the six

property delinquency offenses were more evenly distributed. Among the property delinquency offenses shown at the bottom portion of the table, the most common type of offenses reported was damaging other non-school property (17.7 percent), followed by theft less than \$50 (16.4 percent), damaging school property (13.0 percent), theft more than \$50 (8.1 percent), joyriding (6.4 percent) and breaking into a building or car (5.6 percent).

Tables 15 and 16 present the results of the timing analyses, which was limited to those individuals who reported each separate delinquency offense. Table 15 reports the observed percentage of incidents for each individual violent delinquency offense within each of the six times periods for those individuals who reported committing each of these respective offenses. For all four individual violent delinquency offenses, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 (df= 5,  $p < .01$ ) indicating each individual violent delinquency offense varies significantly by time period.

An examination of the distribution of the observed percentages across the six different time periods for each of the individual delinquency offenses among those individuals who reported committing one or more of these offenses reveals there is more variability across time than one would expect given the results observed in the aggregated total delinquency analysis (see Table 15). However, a closer look at the simple assault offense reveals this particular offense was primarily responsible for the observed pattern of total delinquency and violent delinquency being elevated during the school hours since approximately 75 percent of all individuals who reported hitting other students, did so during school.



On the other hand, Table 15 illustrates the largest percentage of the three remaining violent offenses (carrying a weapon, involvement in gang fights, and robbery) were reported during the weekend hours rather than during the school hours. However, after controlling for the number of hours in each time period, involvement in gang fights (+15.3 percent) and robbery (+15.9 percent) were most elevated during the after-school hours.

Table 16 displays the observed percentage of incidents for each individual property delinquency offense within each of the six time periods for those individuals who reported committing one or more of these respective offenses. For all six individual property delinquency offenses, the  $\chi^2$  test is statistically significant indicating each individual property delinquency offense varies significantly by time period.

The distribution of the observed percentages for the three property victimization offenses across the six different time periods for each offense reported in Table 16 indicates the largest percentage of five of the six property offenses are reported during the weekend hours: 32.1 percent for damaging other property, 50.8 percent for theft of more than \$50, 45.2 percent for theft of less than \$50, 45.3 percent for joyriding, and 46.9 percent for breaking into a building or car. Not surprisingly, the sixth property offense, damaging school property, was reported most often (67 percent of all incidents) during school hours.

An examination of the differences in the observed percentages and the expected percentages (shown in parentheses), indicates theft of more than \$50 (+22.3 percent), joyriding (+16.8 percent) and breaking into a building or car

(+18.3) remain most prominent during the weekend hours, when considering the relative number of hours contained in each of the six time periods. Using the same interpretation, damaging other property (+21 percent) and theft of less than \$50 (+17.7 percent) were most elevated during the after-school hours, while damaging school property (+49.2 percent) was extremely elevated during school hours.

#### Individual Substances Use Offenses

The final grouping of individual offenses focuses on juveniles' reports of their substance using behaviors. Table 7 displays the number and percentage of youth reporting the five individual substance use offenses at any time. The most commonly reported substance used by juveniles was alcohol (25 percent). Juveniles were next most likely to report using cigarettes (13.8 percent), followed by marijuana (7.8 percent), smokeless tobacco (3.7 percent) and hallucinogens (1.8 percent).

Table 17 presents the results of the timing analysis, which focused only on those individuals who reported using each separate substance one or more times. This table indicates the observed percentage of incidents for each individual substance use offense within each of the six times periods for those individuals who reported using each respective type of substance. For four of the five individual substance use offenses, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 (df= 5,  $p < .01$ ) indicating each of these individual substance use offenses varies significantly by time period. The obtained  $\chi^2$  value of 4.6 for hallucinogen use did

not exceed the critical  $\chi^2$  of 15.1 (df= 5,  $p < .01$ ) indicating this substance use behavior did not vary significantly by time period.

An examination of the distribution of the observed percentages for each of the individual substance use offenses across the six different time periods shows that all substances, except hallucinogens, are most likely to be used by juveniles during the weekend hours. However the results reported for hallucinogen are not very useful since very few total incidents of hallucinogen use ( $n = 15$ ) were reported by the sample. Since, the small number of cases results in insufficient variability across the six time periods (as evident by the non-significant chi-square statistic reported in Table 17), the resulting analysis of the timing of hallucinogen use cannot be interpreted with any level of confidence.

When examining the differences between the observed percentages and the expected percentages (if the expected percentages were distributed proportionally to the number of hours contained within each time period), a somewhat different pattern of the timing of juvenile substance use is presented. For alcohol (+26.4 percent) and marijuana use (+18.2 percent), the weekend hours were clearly the most prominent period for juveniles to report using these substances. However, relative to the actual amount of time available to use these substances, cigarette (+15.6 percent) and smokeless tobacco use (+17.3 percent) was slightly more elevated during the after-school hours than during the weekend hours. Interestingly, cigarette, smokeless tobacco, and marijuana use was also high during the before school period, although the peak was generally not as salient as that observed during the weekend and after-school periods.

In summary, the timing of violent and property offenses and timing of individual offenses sections presented above addressed the second research question and its two related hypotheses by examining the timing of the violent and property subcategories, as well as the individual offense behaviors embedded in these measures. Juvenile victimization remained most prominent during the school hours for both violent and property offenses. Similarly, violent delinquency was most prominent during school hours. However, property delinquency was observed most often during the weekend hours and was the most elevated during the after school hours after controlling for the number of hours contained within each of the six time periods. Consequently, the first analysis considered for the second research question rejects hypothesis<sub>2a</sub> and hypothesis<sub>2b</sub> because juveniles were most likely to report the violent offense subcategory for both victimization and delinquency during the school hours.

However, the second research question was also addressed by providing an examination of the individual offense measures. This crime-specific approach revealed the timing pattern for individual offenses was more varied than the timing pattern for the aggregated and subcategory analyses. The most prominent finding was that simple assault was most elevated during school for both offenders and victims. Considering a substantial portion of the sample reported being a victim of and/or committing a simple assault, the elevated during school timing pattern for the aggregated victimization and delinquency was primarily driven by these offenses. However, many of the remaining individual offenses were centered around the after-school hours and somewhat during the weekend hours. In particular, more serious

forms of violent crime such as involvement in gang fights and robbery are elevated after school, while carrying a weapon is most elevated during the weekend. Therefore, in contrast to the findings reported from the first sets of analyses, an examination of the individual victimization and delinquency offenses appears to partially support hypothesis<sub>2a</sub> and hypothesis<sub>2b</sub> since being a victim of an aggravated assault and a being a victim of a threatened beating, as well as committing a robbery and being involved in gang fights, were most prominent during the after-school hours. A further discussion of the possible explanation for the individual timing patterns is provided in Chapter 5.

### **Timing of Repeat Offenses**

In order to address the final research question (and more specifically hypotheses 3<sub>a</sub> through 3<sub>c</sub>), which explore whether high risk (or repeat-incident) individuals are the victims of or commit delinquent offenses during any specific time, the final analyses are an exploratory examination of the various repeat measures included in these data.

### **Repeat Victimization**

It is useful to again begin with an examination of how often survey respondents reported each type of repeat victimization. As indicated in Table 8, approximately 30 percent of the sample reported being a repeat victim, while 53.7 percent of those individuals who reported any victimization were also categorized as repeat victims. In reference to the timing of these repeat victimizations, Table 18

indicates the largest number of juveniles ( $n = 151$ , 18.5 percent) reported being a repeat victim during the school hours. The next most common period for repeat victimization was during the weekend (13.3 percent), followed closely by the after-school hours (12.0 percent).

In order to determine the timing of the repeat victimization for those individuals who actually experienced these behaviors (as addressed in hypothesis 3<sub>a</sub>), the analysis of the timing of the aggregate victimization measure is limited to the total number of individuals who reported any repeat victimization ( $n = 444$ ) in each of the six separate time periods.<sup>17</sup> Table 19 displays the observed percentage distribution of repeat victimizations reported in all six time periods for those individuals who reported any repeat victimization. Among those individuals who reported any repeat victimization, the largest portion (34 percent) was reported during school hours, followed by the weekend hours (24.5 percent) and during the after-school hours (22.1 percent).

The Chi-square ( $\chi^2$ ) statistic reported on Table 19 indicates repeat victimization varies significantly by time period. As reported in all previous analyses, the figures in parentheses on the table provide the difference between the observed percentage and expected percentage of youth who reported any repeat victimization for each time period under the assumption that the percentages are distributed proportionally to the number of hours in each period. The greatest

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<sup>17</sup> The number of cases ( $n=444$ ) for this analyses is larger than the number of cases ( $n=248$ ) for those individuals who reported any repeat victimization at all because individuals who reported one or more repeat victimization experiences in different time periods are included in each time period for which they reported being a repeat victim.

difference between the observed and expected percentage of juveniles who reported any repeat victimization was recorded during the school hours (+16.1 percent) providing further evidence that juveniles were more susceptible to repeat victimization during school hours than during any other time. Any repeat victimization was also elevated during the after-school hours (+11.7 percent) and was depressed in the four remaining time periods.

The next step in the repeat victimization analysis was to explore those individual repeat victimization offenses, which were most commonly reported. These included being a repeat victim of simple assault, threatened beating, theft, and vandalism.<sup>18</sup> Table 20 presents the results of the timing analyses, which focused only on those individuals who reported each of the four most commonly reported repeat victimization offenses. For all four individual repeat victimization offenses, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 (df= 5, p < .01) indicating each individual repeat victimization offense varies significantly by time period.

Table 20 indicates the distribution of the observed percentage of incidents for each individual repeat victimization offense within each of the six times periods for those individuals who reported being the victim of each respective offense. For the individual repeat victimizations of simple assault and theft, the largest percentage of repeat victimization incidents were reported during school hours, 37.7 and 48.6 percent respectively.

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<sup>18</sup> Recall the analyses of individual repeat offenses were limited to the selected sample of offenses, which were reported by five percent or more of the total sample to allow for sufficient variability of these offenses across the six time periods.

Comparatively, the largest observed percentage of repeat threatened beating and repeat theft victimization incidents were reported during the weekend period (30.3 and 31.5 percent respectively). However, an examination of the differences between the observed percentages and the expected percentages (shown in parentheses), reveals that both repeat threatened beating and repeat theft victimizations are most prominent during the after school hours. In sum, the timing of these individual repeat victimizations does not substantially differ from the timing reported for all victimizations included in these same individual offenses.

### Repeat Delinquency

As displayed in Table 8, 30.5 percent of the sample reported any repeat delinquency at any time, while 55.5 percent of those individuals who reported any delinquency were also categorized as repeat delinquents. In reference to the timing of these repeat delinquent experiences, Table 18 indicates the largest number of juveniles ( $n = 201$ , 24.6 percent) reported being a repeat offender during the school hours. The next most common period for repeat delinquency was during the weekend (15.2 percent), followed by the after-school hours (12.0 percent).

In order to address hypothesis 3<sub>b</sub>, the next step in the repeat delinquency analysis was to explore those individual repeat delinquency offenses, which were most commonly reported. These included repeat involvement in gang fights, repeat simple assault, repeat damage of non-school property, and repeat theft less than \$50. Tables 21 presents the results of the timing analyses, which focused only on those individuals who reported each of the four most commonly reported repeat



delinquency offenses. For all four individual repeat delinquency offenses, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 (df= 5, p < .01) indicating each individual repeat delinquency offense varies significantly by time period.

Table 21 indicates the distribution of the observed percentage of incidents for each individual repeat delinquency offense within each of the six times periods for those individuals who reported each respective repeat offense. For the first three individual repeat delinquency offenses, the reported timing pattern did not differ at all from the observed pattern reported for all incidents of these individual offenses. However, the timing pattern for repeat theft of less than \$50 was slightly altered from that observed for all incidents of theft less than \$50. In both analyses, the observed percentage was greatest during the weekend hours, but an examination of the differences between the observed percentages and the expected percentages (shown in parentheses), reveals repeat theft of less than \$50 was most prominent during the weekend hours (+23.0 percent). This differs because all incidents of theft less than \$50 were most elevated during the after-school hours. In other words, the only difference exhibited for the time in which higher risk (or repeat) offenders are most likely to offend versus the time when all offenders are likely to offend existed for one single offense - theft of less than \$50.

### Repeat Substance Use

As indicated in Table 8, 16.4 percent of the sample reported repeat substance use, while 53.8 percent of those individuals who reported any substance use were also categorized as repeat substance users. In reference to the timing of repeat

substance use (as address in hypothesis 3<sub>c</sub>), Table 18 indicates the largest number of juveniles ( $n = 94$ , 11.5 percent) reported being a repeat substance user during the weekend hours. The next most common period for repeat substance use was during the after-school hours (4.7 percent), followed closely by the 6 p.m. to midnight period (4.2 percent).

Table 22 presents the results of the timing analyses, which focused only on those individuals who reported the two most commonly reported types of repeat substance use. For both repeat cigarette and alcohol use, the obtained  $\chi^2$  value exceeds the critical  $\chi^2$  of 15.1 ( $df = 5$ ,  $p < .01$ ) indicating each individual type of repeat substance use varies significantly by time period.

Table 22 illustrates the distribution of the observed percentage of incidents for each individual type of repeat substance use within each of the six time periods for those individuals who reported each respective type of repeat substance use. The reported timing pattern for repeat substance use was identical to the observed pattern reported for all incidents of alcohol use, while the timing pattern for repeat cigarette use was slightly different from that observed for all incidents of cigarette use. In both analyses, the observed percentage of cigarette use was greatest during the weekend hours.

However, an examination of the differences between the observed percentages and the expected percentages (shown in parentheses), where the expected percentages were distributed proportionally to the number of hours contained in each time period, reveals repeat cigarette use was most prominent during the weekend hours (+18.3 percent). This observed pattern is different from

the pattern observed for all incidents of cigarette use, which were most elevated during the after-school hours. Consequently, when taking into consideration the actual amount of time within each of the six time periods in which an individual could smoke cigarettes, repeat cigarette users were most likely to smoke during the weekend as opposed to any other time period.

In summary, the examination of repeat offenses across all offense types did not reveal many substantial differences between the timing of these repeat offenses in comparison to the timing of all reported incidents of these behaviors.

Accordingly, one could reasonably conclude the answer to the third research question, which asked if individuals are more likely to be repeat victims, offenders, or substance users during different time periods than those observed for all incidents of these same behaviors, is no. Therefore, hypothesis<sub>3a</sub> through hypothesis<sub>3c</sub> can also be rejected since there is no clear overall evidence that juvenile victimization, delinquency, or substance use is most prevalent during the after-school hours. Rather, the timing patterns for repeat offenses, in general, mirror those observed for all incidents of their respective behaviors.

## **CHAPTER 5: DISCUSSION**

This chapter provides a summary and discussion of the results presented in the previous chapter. Limitations of the research are next reviewed, followed by a discussion of future research directions, and finally concluded remarks are offered.

### **Summary and Discussion of Findings**

In recent years, after-school programs have received considerable public and policymaker support for their potential to reduce juvenile delinquency and victimization. In a public opinion poll conducted in August 2000, eight out of ten Americans indicated they believed after-school programs could greatly reduce youth violent crime (Newman et al., 2000). In large part, this support stems from a series of recent reports, which indicated juvenile crime and victimization peaks between 2 p.m. and 6 p.m. on school days or during the after-school hours (Snyder et al., 1996; Sickmund et al., 1997; Snyder and Sickmund, 1999).

Other research efforts have examined the timing of juvenile crime and provided evidence that the after-school crime peak may be more modest than suggested in the Snyder and colleagues reports (Gottfredson et al., 2001). While more recent research suggests the timing of juvenile crime may vary according to crime type (Gottfredson and Soulé, 2003; Jacob and Lefgren, 2003). In addition, much of the existing research suffers from a few key limitations, which have been discussed in prior sections of this study. Accordingly, this research has provided

mixed evidence regarding the time when juveniles are most likely to be involved in offending behavior making interpretation of these findings confusing.

Utilizing self report data collected from a sample of juveniles participating in an evaluation of after-school programs in Maryland, this study was designed to clarify our understanding of the timing of juvenile victimization, delinquency, and substance use by addressing some of the key limitations of previous research. In order to thoroughly explore this topic, the results of the current study were reported in various stages of the analyses. The first step was to provide a collective view of the timing patterns by looking at the aggregate composite scales for victimization, delinquency, and substance use. The timing pattern presented by this general overview indicated juvenile victimization and delinquency was most prominent during the school hours, while substance use was elevated during the weekend. The next step in the analysis examined the victimization and delinquency violent and property subcategories (reported in Tables 10 and 11) and again indicated that violent victimization, property victimization and violent delinquency were most prominent during the school hours. However, property delinquency was most elevated during the after-school hours.

Consequently, when juvenile victimization and delinquency were measured using self-report measures, the results suggest previous research may have overestimated the after-school crime peak.<sup>19</sup> Most likely, this stems from a reliance

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<sup>19</sup> Interestingly, property crimes were not included in the series of reports by Snyder and colleagues, which highlighted the observed peak in after-school crime. However, the current study's analyses revealed the property delinquency subcategory was the only aggregated crime type that was elevated during the after-school hours.

solely on official reports of crime, such as those obtained in the NIBRS data. In their analysis of the NCVS data, Whitaker and Bastian (1991) found that only nine percent of violent crimes against juveniles occurring in school were reported to the police compared with 37 percent of those occurring on the streets. Similarly, in their review of juveniles, ages 12 through 17, from the 1995-1996 NCVS data, Finkelhor and Ormrod (1999) noted that approximately 15 percent of school victimizations of juveniles were reported to police, while approximately 37 percent of non-school victimizations were reported to the police. These findings suggest official police data will underestimate juvenile crime and victimizations that occur at school because many of these crimes never reach the attention of the police.

Notably, the next step in the analysis, which included an examination of the individual offenses, revealed more variation in the timing of juvenile victimization and delinquency. Of particular interest, the more serious violent offenses for both victimization (e.g. victim of an aggravated assault) and delinquency (e.g. involvement in gang fights and committing a robbery) were elevated during the after school hours, while simple assaults offenses (for both victims and delinquents) were overwhelming most prominent during school hours.

If one categorizes these individual offenses as minor and serious violent crimes, a distinct pattern about in-school and after-school juvenile crime becomes apparent. More specifically, the most commonly reported type of victimization and delinquency was simple assault. The evidence clearly suggests these incidents are most prominent during the school day. In other words, juveniles are involved in many incidents that result in one student hitting another while in school. This

finding is similar to that reported by a nationally representative survey of school officials. According to data recorded in the 1996-1997 Principal/School Disciplinary Survey conducted through the National Center for Education Statistics (NCES) Fast Response Survey System (FRSS), school officials indicated that physical attack or fights without a weapon were the most commonly reported crimes at the middle and high school levels (USDE, 1997).

Perhaps, the observation that simple assaults are elevated during school, while aggravated assaults are more prominent after-school, may be reflective of an escalation or “spill-over” effect of student fighting. In other words, one can imagine a scenario where some in-school fights are carried over to the after-school and weekend hours and become more serious (e.g. gang involvement or becoming the victim of an aggravated assault) as they move away from school where the possibility of being caught by school officials is diminished. Based on personal observations during numerous visits to Maryland schools during and after school hours, this possible scenario was hypothesized by the author.

Accordingly, two questions regarding student’s estimates of the timing of minor versus more serious fights were added to a focus group interview conducted with 276 students at 54 after-school programs, which participated in the MASOFP evaluation during the 2002-2003 school-year. These focus group interviews were conducted with approximately five volunteer after-school participants at each program during observations conducted by University of Maryland evaluation staff shortly after the administration of the pre-test surveys. The main purpose of the focus group interviews was to ask participants general questions about how much

they liked or disliked the program, what they would change about the program, what they would do if they did not attend the program, etc.

Relevant to this study, focus group participants were asked two questions about their perception of the timing of all students' fights. They were asked to volunteer the time they thought a minor and conversely a more serious fight was most likely to take place during the day<sup>20</sup>. The results to these two questions are reported in Table 23. Slightly less than two-thirds (62.5 percent) of the focus group participants believed minor fights among students their age were most likely to occur during school hours. On the other hand, the largest number of focus group participants (41.5 percent) believed more serious fights were most likely to occur during the after-school hours. While these results are certainly not scientific, they do provide some support for the suggestion that the observed pattern regarding the timing of simple assaults versus more serious offenses may be reflective of an escalation or "spill-over" effect.

The difference in timing regarding more serious and less serious forms of juvenile violent crime is both supported and contradicted by the findings reported by Jacob and Lefgren (2003) who suggested that one undesirable side effect of grouping youth together for schooling is an increase in violent crimes. Jacob and Lefgren (2003:31) noted that schools increase the level of interactions among adolescents, thereby raising the likelihood of violent conflicts. Certainly, the current study's findings regarding extremely elevated levels of simple assaults

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<sup>20</sup> A minor fight was described as fights which are fairly minor, end quickly and no one gets seriously hurt. A more serious fight was described as those which are more serious, weapons may be used, someone may be seriously hurt or someone may require medical attention.



during the school day would seem to support this theoretical framework. In fact, when Jacob and Lefgren estimated the influence of school on individual offenses, the largest reported effect was observed for simple assaults. Furthermore, the observation in the current study that more serious violent offenses are elevated after school may reflect that the proximity of youths in school increases conflict, but the underlying supervision of schools decreases the likelihood of major conflict between juveniles. Consequently, it seems reasonable to suggest that schools may serve as the precursor to subsequent, more violent offenses that are committed outside of the school setting.

A closer examination of the timing of individual property victimizations suggested that two of the three types of property victimizations measured (theft and pocket-picking) were most elevated during school hours. While these results contrast the findings of Jacob and Lefgren (2003) who noted that property crimes decreased on days when students were in school, they do confirm estimates provided in the NCVS data. For example, the NCVS data indicates students were more likely to be victims of theft at school than away from school for all years between 1992 and 1999, except for 1997 (DeVoe et al., 2002).

Interestingly, students' reports of their own offending behavior did mimic the findings reported by Jacob and Lefgren (2003). For all property delinquency offenses, except damaging school property, which logically was most elevated during school hours, the after-school and weekend periods were most often reported as the time juveniles committed these offenses. At first glance, the difference in reporting patterns between property victimization and delinquency may appear

nonsensical. However, the lack of cohesion between the two probably reflects that the majority of the victims of the juvenile property offenses measured in this study are likely to be non-students. For example, the three property delinquency offenses that are most elevated during the weekend hours, theft of more than \$50, joyriding, and breaking into a building, are not likely to be committed against other students since most would not carry \$50 in cash or often keep property valued at \$50 or more in school. Similarly, although data is not available, it seems reasonable to suggest most students in this sample would not own a car or be affected by a break-in to a building. Finally, the survey did not specifically measure if students were victims of these three property offenses and therefore a direct comparison of the timing of the aggregated property victimization and delinquency measures is not possible.

Additionally, the results regarding the timing of juvenile substance use may be of particular interest to parents. Perhaps not surprisingly, the greatest percentage of substance users reported using cigarettes, smokeless tobacco, alcohol, and marijuana during the weekend hours. However after controlling for the actual amount of time available to use these substances in each time period, cigarette and smokeless tobacco use was slightly more elevated during the after-school hours than during the weekend hours. In reference to alcohol and marijuana use, the weekend hours were clearly the most prominent period for juveniles to report using these substances.<sup>21</sup> Perhaps these observed timing patterns are a reflection of the relative seriousness of the substances. Insofar as alcohol and marijuana are likely to need

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<sup>21</sup> As mentioned earlier, it would be particularly interesting to examine the timing of a more serious substance such as hallucinogens, but reports of hallucinogen use were too rare to provide useful estimates.

more privacy to be consumed without fear of repercussions, these results may suggest they are mostly consumed at non-supervised weekend parties. On the other hand, students probably have ample opportunities to smoke cigarettes or use smokeless tobacco (which is easily concealed) immediately after-school and perhaps even on school property without the same concern for facing disciplinary actions from school personnel.

Finally as previously discussed, the examination of repeat offenses did not reveal many substantial differences between the timing of these repeat offenses in comparison to the timing of all reported incidents of these behaviors. The lack of any substantial differences between the timing of all incidents and repeat incidents may be due to the fact that more than half of those individual who reported any involvement in victimization, delinquency, or substance use were also categorized as repeat-incident individuals (see Table 8). Therefore, the results of the analyses for the timing of all incidents were driven in large part by these same repeat incidents and the chance of finding distinct differences between the two sets of analyses was diminished.

### **Limitations of the Study**

As with all research, there are a few key limitations to this study. First, there was some concern that a sample of youth from after-school programs may be a less victimized and less delinquent sample than a nationally representative sample of youth. However, as previously discussed, it appears this sample is generally comparable in terms of rates of delinquency and victimization with other nationally

representative samples. In addition, the general high-risk nature of any juvenile population provides invaluable information regarding juvenile victimization and delinquency experiences.

A second limitation is the measures included in this analysis were limited to juveniles' self-reporting of their own behavior and characteristics. Previous reviews of the use of self-report data as a measure of adolescent victimization and delinquency have suggested that respondents may have substantial reasons for not reporting truthfully or accurately because of their concerns regarding any potential repercussions or because they may want to portray a certain image (Thornberry and Krohn, 2000). Additionally, self-report designs must always be concerned with the ability of survey respondents to remember events accurately. A type of memory fading in self-report survey is telescoping, or the tendency of respondents to move forward and report events that actually took place before the reference period. However, it is reasonable to assume that the advantages of using self-report measures in this study, including a presumably more accurate account of the crime that is underestimated by official records, outweigh these potential sources of reporting error. In addition, highly respected instruments such as the NCVS and the YRBSS use similar self-report methodology and are considered to be standard approaches to exploration of juvenile high-risk behaviors (Kann et al., 2000).

A third limitation is that while this dataset includes measures of property victimization (e.g. theft) and personal victimization (e.g. robbery), the data does not provide information on other types of victimization such as sexual assault and intra-family victimizations. This is a concern since youth are more vulnerable to these

types of victimizations than their adult counterparts (Finkelhor, 1997).

Additionally, the data does not provide an adequate measure for bullying, which has received a great deal of attention since the latest SCS estimates suggest the percentage of students ages 12 through 18 who reported being bullied at school was more prevalent than thought and showed a slight increase from the 1999 SCS (DeVoe et al., 2002). While there is no single accepted definition of bullying, Farrington (1993:384) suggests most researchers agree bullying involves certain key elements such as "physical, verbal, or psychological attack or intimidation that is intended to cause fear, distress or harm to the victim; an imbalance of power, with the more powerful child oppressing a less powerful one; absence of provocation by the victim, and repeated incidents between the same children over an extended period of time." While the data used in this study provide some measures, which mimic "bullying acts" such as being hit by someone or being threatened with a beating, the data do not provide a defensible measure of bullying as outlined by in previous research (Farrington, 1993). Consequently, this study is unable to provide a complete understanding of the entire range of all youth victimization and offending experiences.

A fourth limitation of the current study's data concerns a possibility of seasonality issues relative to the timing measures and the reference period of one year for the outcome measures. More specifically, the questionnaire completed by the study's participants asks respondents to report the timing of their delinquent behaviors and victimization experiences relative to time periods concentrated around the school day (e.g. before, after, and during school). However, the one-year

reference period obviously includes some periods of time where the respondent was not in school (such as during the summer months and holiday breaks). Still, a timing effect during the summer months or during holiday breaks would not be expected. Since this study did find variability across the referenced time periods, it suggests respondents discounted these time periods and reported their behaviors relative to their school calendars. Perhaps this seasonality issue could have been avoided by asking juveniles to keep detailed time calendars of their behaviors on a daily basis. However, this type of research design would be logistically difficult given the size of the population participating in the overall MASOFP evaluation and the amount of additional information that needed to be collected for the overall evaluation. In sum, there will be some imprecision with the timing measures afforded in these data. However, I am satisfied these unique data have still significantly improved measures of the timing of juvenile victimization, delinquency, and substance use beyond what is available from other existing resources.

The final limitation of this research is the study uses a cross sectional design and therefore cannot provide information on chronic offenders or victims. In other words, the cross sectional nature does not allow for the examination of those behaviors which occur in more than one study period. Therefore, a more in-depth research design would incorporate a longitudinal perspective in order to measure chronic offending that spans a few different time periods. However, this study should be viewed as a preliminary step in an orderly progress of science. Based on

the information derived from these analyses, future studies may utilize a prospective longitudinal design as the next logical progression in a chain of research.

While each of these limitations suggests the results should be interpreted with some caution, the previous successful use of similar methodological designs suggests these limitations should not falsify or undermine any of the findings. In addition, I contend that the benefits afforded by these unique data, coupled with an improved research design, which addressed many of the limitations of the existing research, more than outweigh any potential limitations.

### **Future Research**

Future studies could address some of the limitations discussed in the above section. For example, the research might benefit from the use of interviews with individual adolescents that allow the interviewer to use more sensitive screening and follow up questions when a respondent indicates that he/she has engaged in or been a victim of a particular delinquent activity. In particular, the interviewer could more carefully differentiate the timing of individual events when a survey respondent admitted multiple incidents of a particular behavior type. In addition, interviewers could carefully track the seasonality of these reported incidents to distinguish between those offenses reported during the days when school is in session and the days when students are on a break. These methodological enhancements would provide a more accurate picture of juvenile victimization and delinquency over various periods of time and days of the week.

In addition, future research should examine the timing of juvenile victimization, delinquency, and substance use with nationally representative data. Since the current study's data are not representative of any clearly defined population, one cannot confidently assume the results are generalizable to the population as a whole. Furthermore, the inclusion of other measures of more serious offenses (e.g. rape and sexual assault), other commonly experienced offenses (e.g. bullying), and other types of substances (e.g. methamphetamines and cocaine), would expand the scope of the study by examining a more comprehensive range of all juvenile offenses. Consequently, the replication of this study with a wider breadth of behavior measures and the addition of a nationally representative sample would yield a stronger final product.

Finally, future research may also benefit from the use of longitudinal data, which would allow one to examine the timing of chronic victimization, offending, and substance use over multiple time periods. Additionally, a longitudinal design that incorporated separate measuring periods within a one-year timeframe would help clarify the limitation of seasonality. Specifically, this type of research design could provide information on the timing of juvenile behaviors while students are on a break from school such as during the summer and holiday periods. In summary, these suggestions for the direction of future research would help shed light on the timing of juvenile problem behaviors, while providing key evidence that may enhance juvenile victimization, delinquency, and substance use prevention efforts.



## **Conclusions**

The findings reported in this study, considered in whole, suggest that previous research studies that aggregated all types of crimes or focused solely on particular categories of crime, were somewhat misleading in their reports of an after-school crime peak because the timing of juvenile offending varies considerably within specific crime types. If one accepts the current study's general findings that after disaggregating by crime type, less serious forms of juvenile victimization and delinquency are more prevalent during school hours, while more serious offenses are most prominent during the after-school hours and to a lesser extent during the weekend period, then the next step is to determine what prevention efforts, if any, would be most effective for targeting these patterns of behavior.

One common perception has been that after-school programs are a potential "cure-all" for reducing juvenile crime by simply providing adult supervision between the end of the school day and the time when a parent returns home from work. However, given the varied distribution of juvenile victimization and offending behaviors across time, the promise of after-school programs as a mechanism to reduce all juvenile crime, in general, may be overstated. Considering the most prevalent violent offense for both victimization and delinquency, simple assault, is most prominent during the school hours, simply providing a place for youth to go after school would not address the individual violent offense which juveniles are most likely to experience.

Consequently, it may make more sense to employ strategies in both the after-school and in-school settings that have been shown to reduce delinquency by

addressing the underlying causes of problem behavior. Gottfredson (2001) identified effective strategies supported by previous research that have shown to reduce crime and anti-social behavior. Some examples of effective strategies that may be employed in both an after-school and within school setting include programs that focus on teaching social competency skills. Social competency instruction includes lessons on recognizing and resisting social influences, social problem-solving skills, communication, and stress management skills. In fact, one recent evaluation found that after-school programs that incorporated a high emphasis on social skills and character development lessons were most effective at reducing delinquent behavior for middle-school aged youth, while reductions in delinquency were not achieved by simply decreasing time spent unsupervised or by increasing involvement in constructive activities (Gottfredson, Weisman, Soulé, Womer, and Lu, forthcoming). After-school programs are perhaps better suited for meeting the challenge of teaching social competency skills than are school programs since academics must remain the priority during the school day.

However, after-school programs may be more beneficial if they focus on attracting the most at-risk youth and find ways to keep them in attendance. Previous evaluations of after-school programs in Maryland have indicated these programs typically attract a relatively non-delinquent youth population (Gottfredson et al., 2001) and that many of the most at-risk youth drop-out (Weisman, Womer, Lu, Soulé, Bryner, Kahler, Kellstrom, and Gottfredson, 2002). In other words, the typical after-school program is unlikely to provide services for those youths who are most susceptible to offending behavior. While the current study's delinquency

levels are fairly comparable to a nationally representative sample, the substance use rate was less than that reported by the nationally representative NSDPS sample indicating the current study's after-school program population is also less at-risk at least in terms of substance use. This implies that programs must work to target at-risk youths and incorporate strategies aimed at increasing the retention of these juveniles in the programs.

In addition, given the varied distribution of juvenile crime across time and the relatively high rates of victimization and delinquency during the school period, it may make sense to provide primary prevention strategies that include general strategies to target universal populations of juveniles. Universal prevention strategies aim to prevent the onset of youth violence and related risk factors. In this sense, schools are a good medium for prevention programs because they provide regular access to students throughout the developmental years (Gottfredson, 2001). Many of the precursors to delinquency are school-related and are likely to be amenable to change through school-based intervention. In fact, schools may provide the most reliable access to large numbers of potentially crime prone youths.

In her review of effective school-based interventions, Gottfredson (2001) identified four major environmental strategies that have shown strong effects on reducing juvenile crime and antisocial behavior. These include building school capacity, establishing norms/expectations for behavior, changing classroom practices, and grouping students to achieve smaller classes. For example, one study examined Project PATHE, which targeted the entire school population by making plans for each school to clarify rules and utilize consistency of rule enforcement. In

this evaluation, Gottfredson (1986) found the high school population reported significantly less delinquent behavior and drug use after one year of program implementation. Accordingly, a universal approach to juvenile crime prevention also appears promising.

In sum, the utilization of well-tested approaches to addressing the underlying causes of juvenile problem behavior during the times when these behaviors are most prevalent has more promise for reducing juvenile crime. Furthermore, since many victims are also involved in delinquent behaviors and/or have delinquent peers (Jensen and Brownfield, 1986; Lauritsen et al., 1991, 1992; Sampson and Lauritsen, 1990), the evasion of these delinquent behaviors may result in a decreased likelihood of victimization. Therefore, interventions designed to prevent delinquent behavior are also likely to be effective victimization prevention interventions.

**Table 1: Survey Response Rate for Final Sample**

	<b>After School Participant Group</b>	<b>Comparison Group</b>	<b>Total Sample</b>
Registered and Consented	1179	221	1400
Number Pre-Tested	661	156	817
Percentage of Consented Youth Pre-Tested	56%	71%	58%

**Table 2: Demographic Characteristics, Victimization, Delinquency, and Substance Use of MASOFP Participants and Comparison Group**

Variable	MASOFP (N=661)			Comparison Group (N=156)		
	Mean	SD	N	Mean	SD	N
Male (0=F, 1=M)	0.40	0.49	659	0.42	0.49	156
Non-white (0=W, 1=NW)	0.62**	0.49	652	0.41	0.49	155
Age	12.35	1.30	660	12.38	0.95	156
Grade	7.10	1.23	656	6.99	0.82	155
Victimization scale	0.25	0.34	653	0.26	0.34	155
Delinquency scale	0.20	0.29	658	0.22	0.35	155
Substance use scale	0.14*	0.29	657	0.20	0.34	155

Note: \*\* p<.01; \* p<.05

**Table 3: Descriptive Statistics for Total Sample (N = 817)**

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Range</b>	<b>N</b>
Gender (0=F, 1=M)	0.40	.49	0-1	815
Age	12.35	1.25	10-17	816
Grade	7.08	1.17	6-12	811
Black (0=N, 1=Y)	0.49	.50	0-1	807
White (0=N, 1=Y)	0.42	.49	0-1	807
Native American (0=N, 1=Y)	0.01	.12	0-1	807
Asian (0=N, 1=Y)	0.01	.12	0-1	807
Latino (0=N, 1=Y)	0.02	.13	0-1	807
Other race (0=N, 1=Y)	0.04	.20	0-1	807
Nonwhite (0=N, 1=Y)	0.58	0.50	0-1	807
Single parent household (0=N, 1=Y)	0.31	0.46	0-1	810
Two parent household (0=N, 1=Y)	0.42	0.50	0-1	810
Receives free lunch (0=N, 1=Y)	0.44	.50	0-1	767

**Table 4: Descriptive Statistics of Victimization, Delinquency, and Substance Use Aggregate Measures**

<b>Measure</b>	<b>Number of Items</b>	<b>Mean</b>	<b>SD</b>	<b>Alpha Reliability (N)</b>	<b>Range</b>
Victimization	7	.25	.34	.73 (793)	0-2
Violent victimization	4	.24	.37	.61 (800)	0-2
Property victimization	3	.28	.42	.57 (800)	0-2
Delinquent behavior	10	.20	.30	.80 (795)	0-2
Violent delinquency	4	.28	.39	.60 (802)	0-2
Property delinquency	6	.15	.30	.75 (804)	0-2
Substance use	5	.15	.30	.67 (807)	0-2

Note: The N reported for the Alpha Reliability equals the number of valid cases for each measure.



**Table 5: Number and Percentage of Juveniles Reporting Victimization at Any Time, by Type of Victimization**

Type of Victimization	N	Percentage
Any Victimization	462	56.5
Any Violent Victimization	338	41.4
Simple assault (hit by other)	266	32.6
Threatened with beating	163	20.0
Aggravated assault (attacked with a weapon)	60	7.3
Robbery	57	7.0
Any Property Victimization	333	40.8
Theft	269	32.9
Vandalism	146	17.9
Pocket picked (or wallet snatched)	84	10.3

Notes: Percentages based on total sample of 817 youth. Any victimization includes those individuals who reported being the victim of any violent and/or property victimization in the past 12 months. Individual victimization types are listed in order of prevalence within each category of victimization.

**Table 6: Number and Percentage of Juveniles Reporting Delinquent Acts at Any Time, by Type of Delinquent Act**

Type of Delinquency	N	Percentage
Any Delinquency	449	55.0
Any Violent Delinquency	398	48.7
Simple assault (Hit other students)	369	45.7
Involved in gang fights	110	13.5
Carried a weapon	73	8.9
Robbery (Used force to get property)	53	6.5
Any Property Delinquency	269	32.9
Damaged property not at school	144	17.7
Theft <u>less</u> than \$50	134	16.4
Damaged school property	106	13.0
Theft <u>more</u> than \$50	66	8.1
Joyriding	52	6.4
Break into building or car	46	5.6

Notes: Percentages based on total sample of 817 youth. Any delinquency includes those individuals who reported being the victim of any violent and/or property delinquency in the past 12 months. Individual crimes are listed in order of prevalence within each category of delinquency.

**Table 7: Number and Percentage of Juveniles Reporting Substance Use at Any Time, by Type of Substance**

<b>Substance Use</b>	<b>N</b>	<b>Percentage</b>
Any Substance Use	249	30.5
Alcohol	204	25.0
Cigarettes	113	13.8
Marijuana	64	7.8
Smokeless tobacco	30	3.7
Hallucinogens	15	1.8

Notes: Percentages based on total sample of 817 youth. Any substance use includes those individuals who reported using one or more of any of the five substances included in the aggregate substance use measure in the 12 months preceding the survey. Survey respondents were provided examples and other possible names for all types of substances during the survey administration process. Examples of hallucinogens included LSD, Ecstasy, mescaline, PCP, Peyote, and acid. Substances are listed in order of prevalence of use.

**Table 8: Number and Percentage of Juveniles Reporting Any Repeat Incident, by Type of Offense**

Type of Offense	N	Percentage of Total Sample*	Percentage of Respective Category**
Any Repeat Victimization	248	30.4	53.7
Any Repeat Delinquency	249	30.5	55.5
Any Repeat Substance Use	134	16.4	53.8

Notes:

\* Percentage based on total sample of 817 youth.

\*\* Percentage based on number of individuals who were victimized (n=462), committed a delinquent act (n=449), or used an illegal substance (n=249).

**Table 9: Number and Percentage of Juveniles Reporting Any Victimization, Delinquency, or Substance Use, by Type of Offense and Time Period**

Type of Offense	Time Period					
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend
Any Victimization	50 (6.1%)	266 (32.6%)	147 (18.0%)	56 (6.9%)	22 (2.7%)	145 (17.7%)
Any Violent Victimization	24 (2.9%)	146 (17.9%)	109 (13.3%)	37 (4.5%)	15 (1.8%)	91 (11.1%)
Any Property Victimization	29 (3.5%)	171 (20.9%)	69 (8.4%)	27 (3.3%)	11 (1.3%)	92 (11.3%)
Any Delinquency	45 (5.5%)	319 (39.0%)	154 (18.8%)	56 (6.9%)	19 (2.3%)	160 (19.6%)
Any Violent Delinquency	28 (3.4%)	289 (35.4%)	84 (10.3%)	27 (3.3%)	13 (1.6%)	85 (10.4%)
Any Property Delinquency	22 (2.7%)	92 (11.3%)	95 (11.6%)	36 (4.4%)	12 (1.5%)	119 (14.6%)
Any Substance Use	25 (3.1%)	9 (1.1%)	61 (7.5%)	59 (7.2%)	15 (1.8%)	139 (17.0%)

Notes: The number of cases reflects the number of youth who report any victimization, delinquency, or substance use in each of the respective time periods. An individual N within a particular crime category (e.g. any substance use) may include respondents who reported multiple incidents (e.g. use of alcohol and marijuana) during the same time period. Percentages are based on all 817 youths in the sample.

**Table 10: Observed Percentage Distribution of Each Type of Victimization, by Time Period**

Victimization Category	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight -6am	Anytime During Weekend	Proportional Probability
Any Victimization	7.3 (-0.1)	38.8 (+20.9)	21.4 (+11.0)	8.2 (-9.7)	3.2 (-14.7)	21.2 (-7.4)	378.9
Any Violent Victimization	5.7 (-1.7)	34.6 (+16.7)	25.8 (+15.4)	8.8 (-9.1)	3.6 (-14.3)	21.6 (-6.9)	238.8
Any Property Victimization	7.3 (-0.1)	42.9 (+25.0)	17.3 (+6.9)	6.8 (-11.1)	2.8 (-15.1)	23.1 (-5.4)	240.0

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests are based on the number of individuals who reported one or more victimization experiences in each category: 686 for all victimization, 422 for violent victimization, and 399 for property victimization. Individuals who reported one or more victimization experiences in each category are included in each time period for which they reported being victimized. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 11: Observed Percentage Distribution of Each Type of Delinquency, by Time Period**

Crime Category	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Any Delinquency	6.0 (-1.5)	42.4 (+24.5)	20.5 (+10.1)	7.4 (-10.5)	2.5 (-15.4)	21.2 (-7.3)	486.2
Violent Delinquency	5.3 (-2.2)	54.9 (+37.0)	16.0 (+5.6)	5.1 (-12.8)	2.5 (-15.4)	16.2 (-12.3)	568.5
Property Delinquency	5.9 (-1.5)	24.5 (+6.6)	25.3 (+14.9)	9.6 (-8.3)	3.2 (-14.7)	31.6 (+3.1)	150.9

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests are based on the number of individuals who reported committing one or more crimes in each category: 753 for all delinquency, 526 for violent delinquency, and 376 for property delinquency. Individuals who reported one or more crimes in each category are included in each time period for which they reported committing a crime. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 12: Observed Percentage Distribution of Any Substance Use, by Time Period**

Category	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm- Midnight	Midnight -6am	Anytime During Weekend	Prop- ortional Prob- ability
Any Substance Use	8.1 (+0.7)	2.9 (-15.0)	19.8 (+9.4)	19.2 (+1.3)	4.9 (-13.0)	45.1 (+16.6)	124.1

Notes: Chi-square ( $\chi^2$ ) statistic is statistically significant,  $p < .01$ . Percentages and statistical tests are based on the 308 individuals who reported using one or more substances. Individuals who reported using one or more substances are included in each time period for which they reported substance use. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.



**Table 13: Percentage Incidents of Individual Violent Victimization Offenses, by Type of Victimization and Time Period**

Type of Victimization	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Robbery	3.7 (-3.7)	35.2 (+17.2)	16.7 (+6.3)	5.6 (-12.4)	0 (-18.0)	38.9 (+10.4)	28.4
Simple Assault (Hit by other)	4.9 (-2.6)	40.3 (+22.4)	25.0 (+14.6)	7.8 (-10.1)	2.6 (-15.3)	19.4 (-9.1)	190.1
Aggravated Assault (Attacked with weapon)	5.1 (-2.4)	15.3 (-2.5)	30.5 (+20.0)	6.8 (-11.0)	3.4 (-14.4)	39.0 (+10.5)	36.7
Threatened with beating	5.6 (-1.8)	25.6 (+7.7)	25.6 (+15.2)	11.3 (-6.6)	5.6 (-12.3)	26.3 (-2.2)	59.1

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests based on the number of incidents reported for each type of violent victimization: 54 for robbery, 268 for hit by someone, 59 for attacked with weapon, and 160 for threatened with beating. Differences between the observed percentage and expected percentage if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 14: Percentage Incidents of Individual Property Victimization Offenses, by Type of Victimization and Time Period**

Type of Victimization	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Pocket picked	6.5 (-0.9)	49.4 (+31.5)	11.7 (+1.3)	9.1 (-8.8)	2.6 (-15.3)	20.8 (-7.6)	57.9
Theft (other things stolen)	5.7 (-1.8)	54.5 (+36.6)	14.4 (+4.0)	3.4 (-14.5)	2.3 (-15.6)	19.7 (-8.8)	277.6
Vandalism	7.0 (-0.5)	22.5 (+4.6)	22.5 (+12.1)	10.6 (-7.3)	4.2 (-13.7)	33.1 (+4.6)	41.8

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests based on the number of incidents reported for each type of property victimization: 77 for pocket picked, 264 for theft (other things stolen), and 142 for vandalism. Differences between the observed percentage and expected percentage if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 15: Percentage Incidents of Individual Violent Delinquent Offenses, by Type of Crime and Time Period**

Type of Crime	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Carried a weapon	5.3 (-2.2)	22.4 (+4.5)	17.1 (+6.7)	11.8 (-6.1)	2.6 (-15.3)	40.8 (+12.4)	20.1
Involved in gang fights	5.3 (-2.1)	17.7 (-0.2)	25.7 (+15.3)	10.6 (-7.3)	5.3 (-12.6)	35.4 (+6.9)	41.0
Simple assault (hit others)	4.7 (-2.7)	73.4 (+55.5)	12.7 (+2.2)	1.3 (-16.6)	1.3 (-16.6)	6.6 (-21.9)	837.8
Robbery	7.0 (-0.4)	28.1 (+10.2)	26.3 (+15.9)	7.0 (-10.9)	3.5 (-14.4)	28.1 (-0.3)	27.5

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests based on the number of incidents reported for each type of violent delinquency: 76 for carried a weapon, 113 for involved in gang fights, 379 for simple assault (hit others), and 57 for robbery. Differences between the observed percentage and expected percentage if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 16: Percentage Incidents of Individual Property Delinquent Offenses, by Type of Crime and Time Period**

Type of Crime	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Damaged school property	3.1 (-4.3)	67.0 (+49.2)	11.3 (+0.9)	2.1 (-15.7)	5.2 (-12.6)	11.3 (-17.2)	165.9
Damaged other property	2.9 (-4.5)	20.0 (+2.1)	31.4 (+21.0)	12.1 (-5.8)	1.4 (-16.5)	32.1 (+3.6)	87.9
Theft <u>more</u> than \$50	3.4 (-4.1)	8.5 (-9.3)	23.7 (+13.2)	11.9 (-5.9)	1.7 (-16.1)	50.8 (+22.3)	34.4
Theft <u>less</u> than \$50	5.9 (-1.6)	9.6 (-8.3)	28.1 (+17.7)	8.1 (-9.8)	3.0 (-14.9)	45.2 (+16.8)	83.4
Joyriding	9.4 (+2.0)	1.9 (-16.0)	24.5 (+14.1)	9.4 (-8.5)	9.4 (-8.5)	45.3 (+16.8)	27.4
Break into building or car	10.2 (+2.9)	4.1 (-13.9)	26.5 (+16.1)	4.1 (-13.9)	8.2 (-9.8)	46.9 (+18.3)	31.6

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Percentages and statistical tests based on the number of incidents reported for each type of property delinquency: 97 for damaged school property, 140 for damaged other property, 59 for theft more than \$50, 135 for theft less than \$50, 53 for joyriding, and 49 for breaking into building or car. Differences between the observed percentage and expected percentage if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 17: Percentage Incidents of Substance Use, by Type of Substance and Time Period**

Type of Substance	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Cigarettes	10.8 (+3.3)	4.5 (-13.3)	26.1 (+15.6)	13.5 (-4.3)	1.8 (-16.0)	43.2 (+14.7)	64.7
Smokeless tobacco	17.2 (+9.6)	3.4 (-14.5)	27.6 (+17.3)	10.3 (-7.6)	3.4 (-14.5)	37.9 (+9.3)	20.5
Alcohol	3.6 (-3.8)	1.5 (-16.4)	13.3 (+2.9)	21.5 (+3.6)	5.1 (-12.8)	54.9 (+26.4)	101.5
Marijuana	13.3 (+5.8)	5.0 (-12.8)	15.0 (+4.5)	11.7 (-6.1)	8.3 (-9.5)	46.7 (+18.2)	20.9
Hallucinogens	6.7 (-0.6)	13.3 (-4.7)	26.7 (+16.0)	20.0 (+2.0)	13.3 (-4.7)	20.0 (-8.7)	4.6 <sup>NS</sup>

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$  except for hallucinogen use. Percentages and statistical tests based on the number of incidents reported for each type of substance use: 111 for cigarettes, 29 for smokeless tobacco, 195 for alcohol, 60 for marijuana, and 15 for hallucinogens. Differences between the observed percentage and expected percentage if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 18: Number and Percentage of Juveniles Reporting Any Repeat Victimization, Delinquency, or Substance Use, by Type of Offense and Time Period**

Type of Offense	Time Period					
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend
Any Repeat Victimization	28 (3.4)	151 (18.5)	98 (12.0)	42 (5.1)	16 (2.0)	109 (13.3)
Any Repeat Delinquency	28 (3.4)	201 (24.6)	98 (12.0)	44 (5.4)	14 (1.7)	124 (15.2)
Any Repeat Substance Use	13 (1.6)	6 (0.7)	38 (4.7)	34 (4.2)	12 (1.5)	94 (11.5)

Notes: A repeat offense includes any time an individual reported being the victim of or committing an offense two or more times in the past year and any time an individual reported being the victim of or committing two different offenses (within each crime category) in the same reference period (e.g. during school). Ns reflect the number of youth who report any repeat victimization, delinquency, or substance use in each of the respective time periods. An individual N within a particular crime category (e.g. any substance use) may include respondents who reported multiple incidents (e.g. use of alcohol and marijuana) during the same time period. Percentages are based on all 817 youths in the sample.

**Table 19: Observed Percentage Distribution for Each Type of Repeat Offense Category, by Time Period**

Crime Category	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Any Repeat Victimization	6.3 (-1.2)	34.0 (+16.1)	22.1 (+11.7)	9.5 (-8.4)	3.6 (-14.3)	24.5 (-4.0)	193.7
Any Repeat Delinquency	5.5 (-1.9)	39.5 (+21.6)	19.3 (+8.9)	8.6 (-9.3)	2.8 (-15.1)	24.4 (-4.1)	266.0
Any Repeat Substance Use	6.6 (-0.9)	3.0 (-14.9)	19.3 (+8.8)	17.3 (-0.6)	6.1 (-11.8)	47.7 (+19.2)	80.2

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . A repeat offense includes any time an individual reported being the victim of or committing an offense two or more times in the past year and any time an individual reported being the victim of or committing two different offenses (within each crime category) in the same reference period (e.g. during school). Percentages and statistical tests are based on the number of individuals who reported being the victim of or committing a repeat offense in each category: 444 for repeat victimization, 509 for repeat delinquency, and 197 for repeat substance use. Individuals who reported repeat experiences in more than one time period are included in each time period for which they reported being the victim of or committing a repeat offense. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 20: Percentage Incidents of Individual Repeat Victimization, by Type of Victimization and Time Period**

Type of Victimization	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Repeat victim of simple assault	4.3 (-3.2)	37.7 (+19.8)	23.9 (+13.5)	9.4 (-8.5)	3.6 (-14.3)	21.0 (-7.5)	80.0
Repeat victim of threatened beating	6.6 (-0.9)	25.0 (+7.1)	22.4 (+12.0)	9.2 (-8.7)	6.6 (-11.3)	30.3 (+1.8)	21.3
Repeat victim of theft	5.6 (-1.9)	48.6 (+30.7)	15.9 (+5.4)	5.6 (-12.3)	3.7 (-14.2)	20.6 (-7.9)	83.3
Repeat victim of vandalism	1.9 (-5.5)	18.5 (+0.5)	25.9 (+15.5)	14.8 (-3.2)	7.4 (-10.6)	31.5 (+3.0)	18.5

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Repeat victimization includes any time an individual reported being the victim of an individual offense two or more times in the past year. This table only includes the four victimization types, which were reported two or more times in the last year by at least 5 percent of the total sample of 817 individuals. Percentages and statistical tests are based on the number of incidents reported for each type of victimization: 138 for repeat victim simple assault (hit by someone), 76 for repeat victim threatened beating, 107 for repeat victim of theft, and 54 for repeat victim of vandalism. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.



**Table 21: Percentage Incidents of Individual Repeat Delinquency, by Type of Crime and Time Period**

Type of Crime	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Repeat involvement in gang fights	1.7 (-5.8)	20.3 (+2.5)	23.7 (+13.2)	13.6 (-4.2)	6.8 (-11.0)	33.9 (+5.4)	18.1
Repeat simple assault	4.7 (-2.7)	72.0 (+54.1)	11.4 (+0.9)	1.9 (-16.0)	0.9 (-17.0)	9.0 (-19.5)	440.5
Repeat damaged other property	0 (-7.3)	10.2 (-7.8)	32.7 (+22.3)	16.3 (-1.7)	2.0 (-16.0)	38.8 (+10.2)	37.2
Repeat theft <u>less</u> than \$50	7.1 (-0.3)	8.6 (-9.3)	18.6 (+8.2)	11.4 (-6.5)	2.9 (-15.0)	51.4 (+23.0)	31.3

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Repeat delinquency includes any time an individual reported committing an individual offense two or more times in the past year. This table only includes the four crime types, which were reported two or more times in the last year by at least 5 percent of the total sample of 817 individuals. Percentages and statistical tests are based on the number of incidents reported for each type of delinquency: 59 for repeat involvement in gang fights, 211 for repeat simple assault (hit other students), 49 for repeat damaged other property, 70 for repeat theft less than \$50. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 22: Percentage Incidents of Individual Repeat Substance Use, by Type of Substance Use and Time Period**

Type of Substance Use	Time Period						$\chi^2$ (df=5)
	Before School	During School	After School Until 6pm	6pm-Midnight	Midnight-6am	Anytime During Weekend	Proportional Probability
Repeat Cigarette Use	10.2 (+2.9)	4.1 (-13.9)	20.4 (+10.0)	16.3 (-1.7)	2.0 (-16.0)	46.9 (+18.3)	23.2
Repeat Alcohol Use	1.9 (-5.4)	1.9 (-16.0)	12.6 (+2.2)	17.5 (-0.4)	7.8 (-10.1)	58.3 (+29.9)	57.3

Notes: All chi-square ( $\chi^2$ ) statistics are statistically significant,  $p < .01$ . Repeat substance use includes any time an individual reported using the individual substance two or more times in the past year. This table only includes the two substances which were reported being used two or more times in the past year by at least 5 percent of the total sample of 817 individuals. Percentages and statistical tests are based on the number of incidents reported for each type of repeat substance use: 49 for repeat cigarette use and 103 for repeat alcohol use. Differences between the observed and expected percentages if they were distributed proportionally to the number of hours in each period appear in parentheses.

**Table 23: Juveniles' Perceptions of the Timing of Minor and More Serious Fights as Reported in Focus Group Interviews**

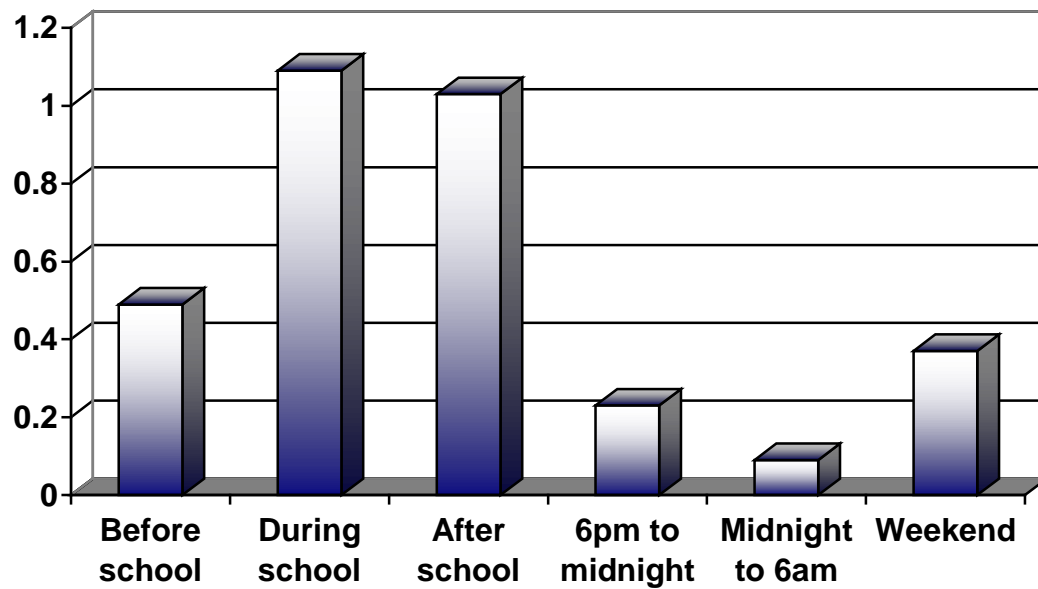
<b>Time Period</b>	<b>Minor Fights Percentage (N)</b>	<b>Serious Fights Percentage (N)</b>
Before School	2.5 (7)	1.4 (4)
During School	62.5 (173)	13.7 (38)
After School	28.5 (79)	41.5 (115)
6:00 pm until Midnight	1.8 (5)	23.1 (64)
Midnight until 6:00 pm	0	1.4 (4)
During the weekend	4.3 (12)	17.0 (47)

Notes: Focus group interviews were completed by 276 youth. Students were asked two questions about the timing of students' fights. They were asked to volunteer the time they each thought a minor fight and a more serious fight were most likely to take place during the day. Four of the 276 youth did not answer the question regarding the more serious fight. Percentages are based on the number of students who believed each type of fight would take place during a particular time period.

A minor fight was described as fights which are pretty minor, end quickly, and no one gets seriously hurt.

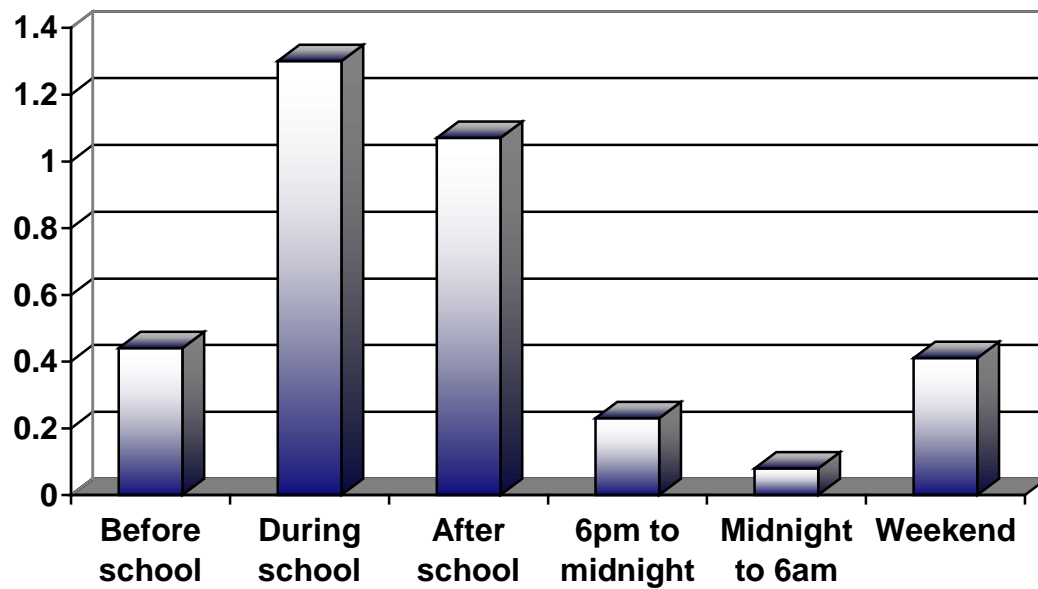
A more serious fight was described as those which can be more serious, weapons may be used, someone may be seriously hurt or someone may require medical attention.

**Figure 1: Timing of Any Victimization Standardized by Hours in Period**



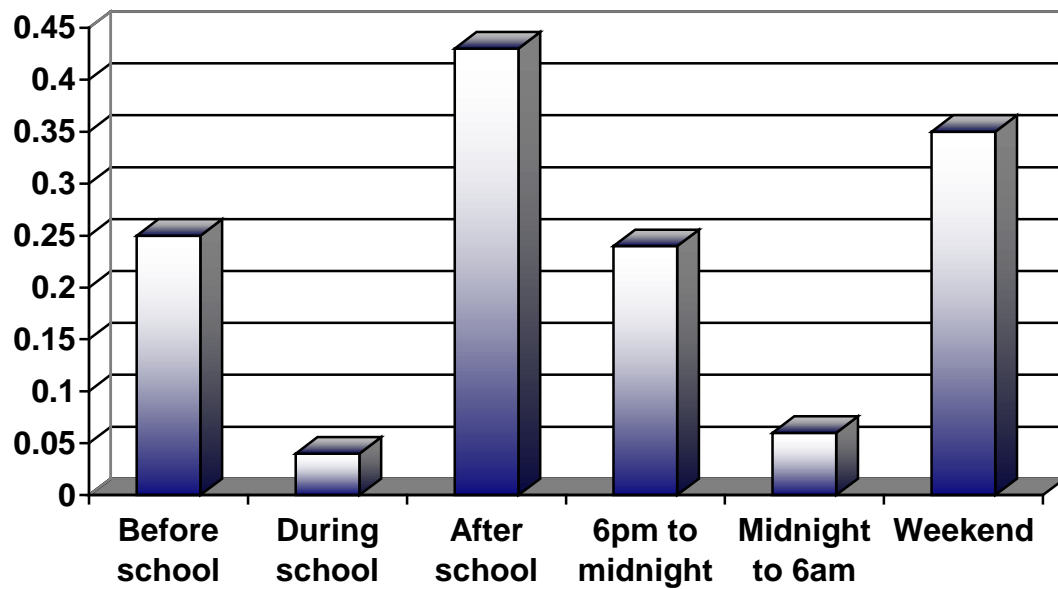
Note: The raw proportion was calculated based on the total sample of 817 survey respondents. This raw proportion was then divided by the number of hours in a week that fall within each time period and multiplied by 100 to calculate the standardized proportion.

**Figure 2: Timing of Any Delinquency Standardized by Hours in Period**



Note: The raw proportion was calculated based on the total sample of 817 survey respondents. This raw proportion was then divided by the number of hours in a week that fall within each time period and multiplied by 100 to calculate the standardized proportion.

**Figure 3: Timing of Any Substance Use Standardized by Hours in Period**



Note: The raw proportion was calculated based on the total sample of 817 survey respondents. This raw proportion was then divided by the number of hours in a week that fall within each time period and multiplied by 100 to calculate the standardized proportion.

## Appendix A: Proportional Sampling Selection for MASOFP Evaluation

County	Total Allocation: FY 2003	Percentage of Total Funding	Total Number of Programs Selected to Participate in Evaluation
Allegany	\$99,838	1.06%	1
Anne Arundel	\$542,768	5.77%	4
Baltimore City	\$1,434,463	15.26%	11
Baltimore County	\$1,204,084	12.81%	10
Calvert	\$290,222	3.09%	2
Caroline	\$100,000	1.06%	1
Carroll	\$286,444	3.05%	2
Cecil	\$225,273	2.40%	2
Charles	\$194,536	2.07%	1
Dorchester	\$100,000	1.06%	1
Frederick	\$409,969	4.36%	3
Garrett	\$142,000	1.51%	1
Harford	\$270,740	2.88%	2
Howard	\$343,462	3.65%	3
Kent	\$150,000	1.60%	1
Montgomery	1,353,975	14.40%	11
Prince George's	1,155,695	12.29%	9
Queen Anne's	\$200,000	2.13%	2
Somerset	\$225,000	2.39%	2
St. Mary's	\$181,218	1.93%	1
Talbot	\$130,000	1.38%	1
Washington	\$230,665	2.45%	2
Wicomico	\$79,648	0.85%	1
Worcester	\$50,000	0.53%	1
<b>Total</b>	<b>\$9,400,000</b>	<b>100%</b>	<b>75<sup>22</sup></b>

<sup>22</sup> The evaluation was originally scheduled to include 75 after school programs. However, two programs scheduled to participate in the evaluation never began operations and therefore could not be included in either the pre-post outcome or the process evaluation.

**Appendix B: Mean Delinquency and Substance Use Scale Scores in Two Samples, by Race, Gender, and Grade Level**

<b>DELINQUENCY</b>						
<b>Sample</b>	<b>White</b>	<b>Non-White</b>	<b>Male</b>	<b>Female</b>	<b>MS</b>	<b>HS</b>
NSDPS	0.12	0.16	0.18	0.09	0.13	0.14
MASOFP	0.10	0.14	0.15	0.11	0.13	0.13
<b>SUBSTANCE USE</b>						
<b>Sample</b>	<b>White</b>	<b>Non-White</b>	<b>Male</b>	<b>Female</b>	<b>MS</b>	<b>HS</b>
NSDPS	0.24	0.22	0.25	0.21	0.17	0.32
MASOFP	0.10	0.11	0.11	0.10	0.10	0.12
<b>VICTIMIZATION</b>						
<b>Sample</b>	<b>White</b>	<b>Non-White</b>	<b>Male</b>	<b>Female</b>	<b>MS</b>	<b>HS</b>
NSDPS	--	--	--	--	--	--
MASOFP	0.17	0.20	0.21	0.17	0.18	0.22

Notes: NSDPS = National Study of Delinquency Prevention in Schools  
MASOFP = Maryland After School Opportunity Fund Program  
MS = Middle School Students (Grades 6-8)  
HS = High School Student (Grades 9-12)



**Appendix C: Proportion of Juveniles Reporting Any Substance Use in Past Year, by Sample and Age**

Age	SAMPLE			
	MASOFP		NSDPS	
	Mean	N	Mean	N
11	0.18	225	0.20	641
12	0.30	250	0.30	2487
13	0.40	220	0.44	3593
14	0.45	67	0.53	3116
15	0.26	27	0.62	2104
16	0.53	15	0.68	1786
17	0.17	6	0.72	1612

Notes: NSDPS = National Study of Delinquency Prevention in Schools  
MASOFP = Maryland After School Opportunity Fund Program  
N = Number of individuals at each age level within each separate sample.

**Appendix D: Correlations for the Aggregate Victimization, Delinquency, and Substance Use Measures**

	1.	2.	3.	4.	5.	6.	7.
1. Victimization	1.00						
2. Violent victimization	.898	1.00					
3. Property victimization	.860	.548	1.00				
4. Delinquency	.418	.402	.329	1.00			
5. Violent delinquency	.375	.366	.288	.892	1.00		
6. Property delinquency	.383	.363	.307	.920	.643	1.00	
7. Substance use	.223	.247	.137	.616	.562	.556	1.00

Note: All correlations are positive and significant at  $p < .001$ .

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